# THE IRON TRADE REVIEW

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IRON AND STEEL REQUIREMENTS
FROM FOUR LARGE SERVICE PLANTS

JOSEPH T. RYERSON & SON
IRON STEEL MACHINERY

Advertisers' Index, pages 163-164-165. Contents, page 81. "Where-to-Buy," page 92.
Engineering Directory, pages 130-131. Classified Advertisements, pages 140-162.

# MORE KOPPERS OVENS

AN addition of 15 KOPPERS OVENS to the by-product coke plant of the Indiana Coke and Gas Company of Terre Haute, Indiana, will be built by H. Koppers Company. The KOPPERS OVEN represents years of experience in the design and construction of by-product coke ovens.

## H. KOPPERS COMPANY

Designers - Builders - Operators
of
By-Product Coke Plants

PITTSBURGH, PA.

*Say you saw it in* THE IRON TRADE REVIEW

THE IRON TRADE REVIEW

*Vol. LXII* Cleveland, April 11, 1918 *No. 15*

# War Steel Demand Is Tremendous

## Shell Steel Requirements Partially Allotted Call For Over 4,000,000 Tons This Year —Realignment of Operations May Be Necessitated—Railroad Program Needs Are Large—Shipyard Delays Not Due to Plate Mills

WAR DEMANDS are crowding back every other consideration in iron and steel. As the government's unparalleled program of preparations advances into the production stage, the tonnage required is exceeding all previous estimates. The time seems not so far ahead when the industry virtually will have been converted into a vast unified war machine. Many mills now are able to ship nothing but Class A material and the list is growing steadily.

**Shell Needs Enormous**

Nothing so clearly illustrates the superlative scale to which the steel industry is being committed to war as the tremendous purchases of shell steel now being made by the government. The total requirements which the United States and its allies are calling upon the producers to supply in the current year are in excess of 4,000,000 tons of 4½ to 9½-inch rounds. Of this amount, about 1,200,000 tons for this government are undergoing allocation. The total of 4,000,000 tons represents probably one-sixth of the expected rolled output of the country from this date to Jan. 1, 1919. There is some question whether billet and bar mill capacity as at present operated will be sufficient to meet this demand. In that event, some sweeping changes in the present realignment of finishing capacity may be necessitated, thereby further dislocating established production. Another point of interest is whether present shell forging capacity is adequate to all needs. That advantage is to be taken of Canada's facilities in this regard is indicated by the award of 115,000 tons for that country, with 75,000 tons unplaced.

The steel requirements of the proposed government car purchases now may be more accurately figured. Exclusive of the castings, the 70-ton all-steel types will call for 19 tons, and the 50-ton types for 16 tons of material each. This means in the aggregate about 1,500,000 tons for the 100,000 cars to be distributed. The bids submitted by the builders are still under consideration at Washington.

**Propose New Standards**

The great demand for steel castings for railroad equipment and other war work has brought to a critical point the movement calling upon the government to modify its present chemical specifications and inspection methods. Manufacturers of steel castings acting concertedly have formally recommended to the government that the phosphorus and sulphur limits be raised and a uniform inspection system be adopted if production is to be increased or maintained at the required level.

If the lagging in shipbuilding has been due in any measure to the lack of steel in the yards, this is not to be charged to the mills. Statistics of the steel director show that more ship plates were rolled in the first quarter than were required by the builders. Recent shortages of plates in the shipyards are attributed to a lack of definite information as to what would be required and to transportation difficulties.

**Problem of Iron Orders**

The call upon the government by consumers to supply them with pig iron which they find themselves unable to buy in the open market continues to grow. The situation in this regard has reached the point where it is involving private obligations of the furnaces and this has forced consideration to be given to new methods of allocation. Heretofore orders for the government have been distributed and accepted by the furnaces largely on a loyalty basis. Since former obligations now are being displaced involving complications, it is proposed that the various government departments place in their name with the furnace forwal orders for the iron desired, which would supersede prior bookings for general consumers. An Ohio river steelmaker is seeking 15,000 to 30,000 tons of basic through government allocation. Lifting of the embargo on southern iron is not expected to release immediately the estimated 225,000 tons of sold metal piled on furnace banks there awaiting shipment, since the car supply still is inadequate.

The Iron Trade Review.

# EDITORIAL

## Government Co-operation is Needed

FOR many months the production of steel castings for various departments of the government has been retarded and delayed by inefficient inspection. This has involved the rejection of many tons of cast parts that would have been accepted commercially, but because they did not conform to the government specifications in some slight technicality the inspectors, lacking judgment, refused to pass them. One steel casting manufacturer has reported that an inspector sent to his plant was without knowledge of the progress that has been made in the welding of steel castings, whereby many defects are repaired, and accordingly all welded castings were condemned by this representative of the government. This critical inspection has reached a point where the construction of ordnance and parts of battleship and destroyer is being actually held up.

The Steel Founders' Society of America, representing approximately 175 steel casting plants, has addressed a communication to the various departments of the government suggesting a unification of steel casting standards and the establishment of a central inspection bureau. Today, all of the government departments have separate steel casting specifications, which differ in many important details, and separate corps of inspectors are maintained by each department. The establishment of an inspection bureau to handle all steel casting production would greatly reduce the cost of inspection, would reduce the number of inspectors employed, and would permit of securing well qualified inspectors.

A further recommendation made is for an immediate increase in the maximum limits of the sulphur and phosphorus content of steel castings. For many months the supply of low phosphorus pig iron and scrap has been inadequate to meet the needs of the open-hearth plants, yet notwithstanding the inability of steel casting producers to meet the low phosphorus limit, the government departments have refused to grant any relief. The Steel Founders' Society demands that for castings made by the open-hearth process, the phosphorus maximum be increased to 0.06 per cent from 0.05 per cent, and a similar increase in the sulphur limit also is suggested. A much greater increase in the sulphur and phosphorus limits for side-blown converter metal, however, is recommended. A sulphur maximum of 0.08 per cent is suggested, with a limit of 0.07 per cent for phosphorus.

The reason for the big increase in sulphur content is due to the inability to secure cupola metal sufficiently low in this element to charge into the converter. Coke is running high in sulphur and the absorption of this element while melting in the cupola furnace adds further to the content of the sulphur in the original charge. It also is pointed out by many steel foundrymen that sulphur is not nearly so undesirable as generally believed. Dr. Unger of the Carnegie Steel Co. has made tests of steel which proved that the physical properties of rolled products containing more than the allowable sulphur content were not impaired, and F. N. Speller of the National Tube Co. has made similar experiments on pipe and tubes with concordant results. The demand for a higher permissible sulphur content not only in steel castings, but in rolled steel products is growing more insistent and it is believed that users, including the government, no longer can turn a deaf ear to the demands of producers if they expect to obtain an adequate supply of material.

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## Just Appreciation of True Service

GRATIFICATION generally is expressed in the iron and steel industry that the functions and extent of the proposed hearings of the price committee of the war industries board have been elucidated and Chairman Brookings declares there is no intention of interfering with the present methods of contact between the manufacturers and the government. From remarks made at the recent Washington conference between iron and steel producers and the price committee, the impression had gone out widely that the former proposed to hold continuous sessions and consider any requests, complaints or suggestions that might be laid before it. So concisely was this belief entertained that much apprehension was aroused lest such a plan would undermine the present effective and harmonious relations between the government and the industry. The mischievous possibilities of a constant rehashing of complaints and points of dissatisfaction by individual interests before government representatives was pointed out editorially in these columns. It was urged that the government continue to recognize the wisdom of the policy of leaving largely to the industry itself the regulation and enforcement of price control.

Representatives of the committee, as stated in THE IRON TRADE REVIEW of April 4, have declared that Chairman Brookings' statement before the conference to the effect that his committee would be sitting almost continuously and would be glad at any time to take

up any question which the industry would like to have settled, has been misconstrued. It is explained that such questions are only to be considered as put up to the committee through the general steel committee of the American Iron and Steel institute, or in accordance with the method pursued in the past. It is pointed out there is no intention to usurp present functions performed by the institute committee. Such an explanation is salutary and has been needed to set the minds of the industry at ease.

The manner in which the price-fixing committee proposes to carry on its duties, as now more definitely outlined by its spokesmen, represents a tacit recognition and endorsement of the fair and honorable treatment the government is receiving from the industry through the latter's accredited representatives acting through the American Iron and Steel institute. It is well that this is so. If the war industries board ever has entertained the advisability of a policy of greater direct regulation of the industry in order to more fully exercise its inherent powers, the recent discussions even though happily based on a misapprehension will serve an instructive purpose. Iron and steel leaders in behalf of the industry cheerfully have accepted their responsibility in the present crisis and they may be expected to render the government the complete service that practical patriotism shall dictate. The results to date demonstrate there is no occasion for increased federal interference.

## The Dilemma of the Dealer

REGULATION of the iron and steel industry by means of maximum prices has affected, more than any other class, the dealers and brokers throughout the country. With consumption so far in excess of production as it has been during the past year, selling competition has been wiped out. The usual methods of distribution have been reversed and it now is the consumer who seeks the favor of the producer.

The usefulness of the dealer in normal times has not been questioned. He studies the definite requirements of his customers, guarantees their credit and stands responsible for the delivery of the material, thus leaving the producer free to concentrate his energies on actual production.

In the case of pig iron, many dealers have suffered acutely of late through the refusal of some of the furnaces to pay the usual selling commissions. The latter in many cases insist upon getting the maximum price, thus giving the dealer the choice of collecting a commission from the consumer or of confining his compensation to the pleasure he derives from the transaction of business. Many of the dealers, in the lack of definite authorization to collect such a commission from consumers, have preferred to sacrifice this profit rather than charge anything higher than the government maximum figure. As long as prices remain at the maximum, they will have no opportunities for merchandizing. Another example of the dealer who has been hard hit by the lack of authorization to collect a commission for his services, is in scrap.

Under present conditions, the business of the legitimate dealer in iron and steel is left hanging in the air. Surely, in justice, he is entitled to know where he stands. If he serves a necessary and useful purpose in the current scheme of distribution, he should be given the proper credentials; if not he should be told exactly that his position is a superfluous one. It is to be hoped that the war industries board, if it reviews the claims of the scrap dealers for commissions, will make a definite ruling that will clarify the present situation.

## Winning a Rightful Place

DOMESTIC makers of high speed steel have developed a product whose excellence is pronounced to be equal or superior to that imported to the United States in prewar days. Its quality has been thoroughly demonstrated and in tests made tools manufactured in this country have performed difficult cutting operations which those made from foreign steel could not accomplish. Development of this industry has been of invaluable aid in preparing the war machine and it is a source of satisfaction and pride that no longer will it be necessary to rely on foreign manufacturers for this grade of tool steel. The war has shut off much of the accustomed importations. In the meantime users are becoming acquainted with the high quality of the domestic product and those who have resorted to its use will no doubt continue to do so after the war, excepting perhaps those with whom the habit of using foreign steel, with well-established names, has become so firmly intrenched that nothing may overcome it. The American manufacturers deserve to be given preference, not only because it will give patronage to a domestic industry, but also because of the real merit of their product. The expanded tool steel industry will be vitally important in aiding this country to hold its share of trade after the war.

# Iron and Steel Prices

**Corrected to Wednesday Noon**

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 954

## PIG IRON

| | |
|---|---|
| Bessemer, valley | $35.20 |
| Bessemer, Pittsburgh | 36.15 |
| Basic, Pittsburgh | 32.95 |
| Basic, eastern Pa. | 32.00 |
| Basic, Buffalo | 32.00 |
| Malleable, Pittsburgh | 34.45 |
| Malleable, Chicago | 33.50 |
| Malleable, Philadelphia | 34.00 to 37.50 |
| Malleable, Buffalo | 33.50 |

**GOVERNMENT SCHEDULE**

1.75 to 2.25 silicon (No. 2 foundry, No. 2 plain, and No. 3 southern), $33 furnace base.

2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern), base plus 50c.

2.75 to 3.25 silicon (No. 1X, No. 2, soft), base plus $1.50.

Over 3.25 silicon, $34.50, plus $1.00 for each ½ per cent of silicos.

| | |
|---|---|
| No. 1X, Phila. | 35.25 to 35.50 |
| No. 2 foundry, Pittsburgh | 33.95 |
| No. 2 foundry, Cleveland | 33.95 |
| No. 2 foundry, Ironton | 33.00 |
| No. 1 foundry, Chicago | 33.50 |
| No. 2 foundry, Chicago | 33.00 |
| No. 2X foundry, Phila. | 34.25 to 34.50 |
| No. 2X foundry N. J. tide | 34.25 to 34.50 |
| No. 2X foundry, Buffalo | 33.50 |
| No. 2 plain, Philadelphia | 33.75 to 34.00 |
| No. 2 plain, N. J. tide | 33.75 to 34.00 |
| No. 2 southern Birmingham | 33.00 to 33.50 |
| No. 2 southern, Cincinnati | 36.40 |
| No. 2 southern, Chicago | 37.50 |
| No. 2 southern, Phila. del. | 38.30 to 39.40 |
| No. 2 southern, Cleveland | 37.50 |
| No. 2 southern, Boston | 39.50 |
| No. 2 southern, St. Louis | 35.90 |
| Virginia, No. 2X, furnace | 33.50 |
| Virginia, No. 2X, Phila. | 36.77 |
| Virginia, No. 2X, Jersey City | 37.02 |
| Virginia, No. 2X, Boston | 37.27 |
| Gray forge, Pittsburgh | 32.95 |
| Silveries, 8 per cent, furnace | 46.00 |
| Silveries, 8 per cent, Chicago | 48.54 |
| Low phos. standard, Phila. | 55.00 to 56.00 |
| Low phos., Lebanon furnace | 50.00 |
| Low phos., Pittsburgh | 53.00 |
| Charcoal, Superior, Chicago | 37.50 |
| Charcoal, Superior, Buffalo | 39.75 |
| Charcoal, southern furnace | 43.00 |

## COKE

(At the ovens)

| | |
|---|---|
| Connellsville furnace | $6.00 |
| Connellsville foundry | 7.00 |
| Pocahontas furnace | 8.00 |
| Pocahontas foundry | 8.00 |
| New River foundry | 8.00 |
| New River furnace | 7.00 |
| Wise county furnace | 6.00 |
| Wise county foundry | 7.00 |

## FERROALLOYS

| | |
|---|---|
| Ferromanganese, 80 per cent delivered | $275.00 |
| Ferromanganese, 70 per cent delivered | 250.00 |
| Spiegel, 16 per cent fur. | 70.00 |
| Spiegel, contracts, furnace. | 70.00 |
| Ferrocarbon titanium, carloads, maker's plant | 200.00 |
| Ferrosilicon, 50 per cent, second quarter, Pitts. | 170.00 to 185.00 |
| Ferrosilicon, 50 per cent, Pitts., remainder of 1918 | 155.00 |
| Bessemer ferrosilicon, 9 per cent. | $54.00 |
| Bessemer, ferrosilicon, 10 per cent. | 55.00 |
| Bessemer ferrosilicon, 11 per cent. | 58.30 |
| Bessemer ferrosilicon, 12 per cent. | 61.60 |

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

## SEMIFINISHED MATERIAL

**BILLETS**

| | |
|---|---|
| Open-hearth, Pittsburgh | $47.50 |
| Open-hearth, Philadelphia | 50.50 |
| Open-hearth, Youngstown | 47.50 |
| Bessemer, Pittsburgh | 47.50 |
| Bessemer, Youngstown | 47.50 |
| Forging, Pittsburgh | 60.00 |
| Forging, Philadelphia | 63.00 |

**SHEET BARS**

| | |
|---|---|
| Open-hearth, Pittsburgh | $51.00 |
| Open-hearth, Youngstown | 51.00 |
| Bessemer, Pittsburgh | 51.00 |
| Bessemer, Youngstown | 51.00 |

**WIRE RODS AND SKELP**

| | |
|---|---|
| Wire rods, Pittsburgh | $57.00 |
| Grooved skelp, Pitts. | 2.90c |
| Sheared skelp, Pitts. | 3.25c |

## SHAPES, PLATES AND BARS

(In cents per pound)

| | |
|---|---|
| Structural shapes, Pitts. | 3.00c |
| Structural shapes, Phila. | 3.185c |
| Structural shapes, N. Y. | 3.195c |
| Structural shapes, Chgo. | 3.00c |
| Tank plates, Chicago | 3.25c |
| Tank plates, Pittsburgh | 3.25c |
| Tank plates, Philadelphia | 3.435c |
| Tank plates, New York | 3.445c |
| Bars, soft steel, Pittsburgh | 2.90c |
| Bars, soft steel, Chicago | 2.90c |
| Bars, soft steel, New York | 3.095c |
| Bars, soft steel, Phila. | 3.085c |
| Bar iron, Chicago | 3.50c |
| Bar iron, Phila. | 3.50c to 3.685c |
| Bar iron, Cleveland | 3.64c to 3.70c |
| Bar iron, New York | 3.695c |
| Bar iron, Pittsburgh | 3.50c |
| Hard steel bars, Chicago | 3.00c |

## RAILS, TRACK MATERIAL

| | |
|---|---|
| Angle bars, Pittsburgh base. | 3.25c |
| Angle bars, Chicago base | 3.25c |
| Standard bessemer rails, mill | $55.00 |
| Stand. open-hearth rails, mill | $7.00 |
| Light rails, 25 to 45, mill | 3.00c |
| Relaying rails, light, St. L. | 60.00 to 67.00 |
| Spikes, railroad, Pitts. | 3.90c |
| Track bolts, Pittsburgh | 4.90c |
| Track bolts, Chicago | 5.115c |
| Tie plates, Chicago | 3.25c |

## WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

| | |
|---|---|
| Wire nails, Pittsburgh | $3.50 |
| Coated nails, Pittsburgh | 3.45 |
| Plain wire, Pittsburgh | 3.25 |
| Galvanized wire, Pittsburgh | 3.95 |
| Polished staples, Pittsburgh | 3.65 |
| Galvanized staples, Pbgh. | 4.35 |
| Barb wire, painted, Pitts. | 3.65 |
| Barb wire, galvanized, Pitts. | 4.35 |
| Cut nails, Pittsburgh | 4.00 |

## CHAIN, PILING, STRIP STEEL

(In cents per pound)

| | |
|---|---|
| Chain, ¾ in. proof coil, Pitts. | 8.00c |
| Sheet piling, base, Pitts. | 4.00c to 5.00c |

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

## Market Report Index


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## SHEETS

(In cents per pound)

**SHEET MILL BLACK**

| | |
|---|---|
| No. 28, open-hearth, Pitts. | 5.00c |
| No. 28, bessemer, Pitts. | 5.00c |
| No. 28, open-hearth, Chi. | 5.215c |

**TIN MILL BLACK**

| | |
|---|---|
| No. 28, open-hearth, Pitts. | 5.00c |
| No. 28, bessemer, Pitts. | 5.00c |

**GALVANIZED**

| | |
|---|---|
| No. 28, open-hearth, Pitts. | 6.25c |
| No. 28, bessemer, Pitts. | 6.25c |
| No. 28, open-hearth, Chi. | 6.465c |

**BLUE ANNEALED**

| | |
|---|---|
| No. 10, open-hearth, Pitts. | 4.25c |
| No. 10, bessemer, Pitts. | 4.25c |
| No. 10, open-hearth, Chi. | 4.465c |
| No. 10, open-hearth, Phila. | 4.435c |

## TIN PLATE

(Per 100 lb. box)

| | |
|---|---|
| Tin plate, coke base, Pitts. | $7.75 |

## IRON AND STEEL PIPE

**Base Pittsburgh**

| Base Pittsburgh | Black (Per cent off) | Galv. (Per cent off) |
|---|---|---|
| ⅜ to 3 in., butt, steel | 51 | 37½ |
| ⅜ to 3 in., butt, iron | 33 | 17 |

## BOILER TUBES

| | |
|---|---|
| Steel, 3½ to 4½ inches, l. c. l. | 30 |
| Iron, 3½ to 4½ inches, c. l. | 12½ |

## CAST IRON WATER PIPE

(Class B Pipe)

| | |
|---|---|
| Four-inch, Chicago | 57.30 |
| Six-inch and over, Chicago | 54.30 |
| Four-inch, New York | 58.35 |
| Six-inch and over, N. Y. | 55.35 |
| Four-inch, Birmingham | 52.00 |
| Six-in. and over, Birmingham | 49.00 |

## HOOPS, BANDS, SHAFTING

Class A pipe is $1 higher than Class B.

| | |
|---|---|
| Hoops, Pittsburgh | 3.50c |
| Bands, Pittsburgh | 2.90c |
| Shafting, Pitts., carloads | 17 off to list |

## RIVETS

| | |
|---|---|
| Structural rivets, Pittsburgh. | 4.65c |
| Boiler rivets, Pittsburgh | 4.75c |
| Rivets ⅞ in. and smaller, Pitts. | 45 and 10 off |

## NUTS AND BOLTS

(Delivered within 20-cent freight radius)

**CARRIAGE BOLTS**

(⅜ x 6 inches, smaller and shorter)

| | |
|---|---|
| Rolled thread | 50–5 off |
| Cut thread | 40–10–5 off |
| Larger and longer | 40 off |

**MACHINE BOLTS**

(⅜ x 4 inches, hot pressed nuts)

| | |
|---|---|
| Rolled thread | 50–10–5 off |
| Cut thread | 50–5 off |
| Larger and longer | 40–10 off |
| Cold pressed semi finished hexagon nuts ⅜ in. and larger | 60–10–10 off |
| Cold pressed semi finished hexagon nuts ⅞ in. and smaller | 70–5 off |
| Gimlet and cone point lag screws | 50–10 off |

**NUTS**

| | |
|---|---|
| Hot pressed, square blank | 2.50c off |
| Hot pressed, square tapped | 2.30c off |
| Hot pressed, hexagon blank | 2.30c off |
| Hot pressed, hexagon tapped | 2.10c off |
| Cold pressed, square blank | 2.25c off |
| Cold pressed, square tapped | 2.00c off |
| Cold pressed, hexagon blank | 2.25c off |
| Cold pressed, hexagon tapped | 2.00c off |

## Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

**Quotation on leading products April 10, average for March, 1918, average for January, 1918, and average for April, 1917. Prices are those ruling in the largest percentage of sales at the dates named**

| | Prices April 10, 1918 | Average prices March, 1918 | Jan., 1918 | April, 1917 |
|---|---|---|---|---|
| Bessemer pig iron, Pittsburgh.. | $36.15 | $37.25 | $37.25 | $42.20 |
| Basic pig iron, Pittsburgh..... | 32.95 | 33.95 | 33.95 | 39.20 |
| *No. 2 Foundry pig iron, Pitts. | 33.95 | 33.95 | 33.95 | 39.95 |
| *No. 2, Foundry pig iron, Chi. | 33.00 | 33.00 | 33.00 | 39.25 |
| Lake Superior charcoal, Chicago | 37.50 | 37.50 | 37.50 | 42.25 |
| Malleable, valley ..... | 33.50 | 33.50 | 33.50 | 36.00 |
| Malleable, Chicago ..... | 33.50 | 33.50 | 33.50 | 39.00 |
| **Southern, No. 2, Birmingham. | 33.50 | 33.50 | 33.50 | 35.79 |
| *Southern Ohio No. 2, Ironton | 33.00 | 33.00 | 33.00 | 38.60 |
| Basic, eastern Pa..... | 32.00 | 33.00 | 33.00 | 38.25 |
| **No. 2X Virginia, furnace.... | 33.50 | 33.50 | 33.50 | 38.25 |
| **No. 2X foundry, Philadelphia | 34.25 | 34.25 | 34.25 | 41.50 |
| Ferromanganese, 70%, delivered. | 250.00 | 250.00 | 250.00 | 360.00 |
| Bessemer billets, Pittsburgh.... | 47.50 | 47.50 | 47.50 | 72.50 |
| Bessemer sheet bars, Pittsburgh | 51.00 | 51.00 | 51.00 | 72.50 |
| Open-hearth sheet bars, Pitts.. | 51.00 | 51.00 | 51.00 | 72.50 |
| Open-hearth billets, Pitts..... | 47.50 | 47.50 | 47.50 | 72.50 |
| Steel bars, Pittsburgh..... | 2.90 | 2.90 | 2.90 | 3.38 |
| Steel bars, Chicago..... | 2.90 | 2.90 | 2.90 | 3.54 |
| Iron bars, Philadelphia..... | 3.50 | 3.50 | 3.648 | 3.659 |

*To 2.25 silicon. **2.25 to 2.75 silicon.

| | Prices April 10, 1918 | Average prices March, 1918 | Jan., 1918 | April, 1917 |
|---|---|---|---|---|
| Iron bars, Cleveland..... | $3.64 | 3.64 | 3.64 | 3.25 |
| Iron bars, Chicago mill..... | 3.50 | $3.50 | $3.50 | $3.19 |
| Beams, Chicago ..... | 3.00 | 3.00 | 3.00 | 3.79 |
| Beams, Pittsburgh ..... | 3.00 | 3.00 | 3.00 | 3.70 |
| Beams, Philadelphia ..... | 3.185 | 3.185 | 3.185 | 4.159 |
| Tank plates, Pittsburgh..... | 3.25 | 3.25 | 3.25 | 4.50 |
| Tank plates, Chicago..... | 3.25 | 3.25 | 3.25 | 4.69 |
| Tank plates, Philadelphia..... | 3.435 | 3.435 | 3.435 | 6.909 |
| Sheets, blk., No. 28, Pitts..... | 5.00 | 5.00 | 5.00 | 5.75 |
| Sheets, blue anld., No. 10, Pitts. | 4.25 | 4.25 | 4.25 | 3.75 |
| Sheets, galv., No. 28, Pitts.... | 6.25 | 6.25 | 6.25 | 3.75 |
| Wire nails, Pittsburgh..... | 3.50 | 3.50 | 3.50 | 3.20 |
| Connellsville furnace coke..... | 6.00 | 6.00 | 6.00 | 7.25 |
| Connellsville foundry coke..... | 7.00 | 7.00 | 7.00 | 7.87 |
| Heavy melting steel, Pitts..... | 29.00 | 30.00 | 30.00 | 28.12 |
| Heavy melting steel, eastern Pa. | 28.00 | 29.50 | 29.80 | 25.15 |
| Heavy melting steel, Chicago.. | 29.00 | 30.00 | 29.70 | 26.63 |
| No. 1 wrought, eastern Pa..... | 34.00 | 35.00 | 35.00 | 38.50 |
| No. 1 wrought, Chicago..... | 34.00 | 35.00 | 35.00 | 33.30 |
| Rerolling rails, Chicago..... | 34.00 | 35.00 | 35.30 | 31.90 |

(For Additional Prices See Page 890)

# Appeal to Government For Pig Iron

### More Consumers Unable to Buy Themselves Seek Aid By Allocation—Increasing Infringement Upon Furnace Obligations Causing Complications and May Require Definite Official Orders—Inquiry Continues Large

Cleveland, April 9.—Requests from consumers for government aid in covering pig iron needs are more numerous. As a result former obligations of the furnaces are being infringed upon. Heretofore allocations have been made on a loyalty basis. It now is proposed that definite orders be issued by the government department in whose interest the iron is to be supplied. This is to avoid legal complications. An Ohio river steelmaking interest who has been seeking 15,000 to 30,000 tons of basic for second, third and fourth quarters has asked Washington authorities to get this iron for it. For a Kalamazoo, Mich., fuse manufacturer, 700 tons of No. 2 and 175 tons of 6 per cent silica are wanted for prompt shipment. The Watertown, N. Y., arsenal is inquiring for 800 tons of standard low phosphorus and 200 tons of copper-bearing iron for May-July shipment. For the Boston navy yard 150 tons of low phosphorus has been allocated. Alabama makers will supply 1000 tons of foundry to the Italian government and 2000 tons of bessemer for the same buyer is expected to be drawn from iron originally sold for export which has accumulated along the Atlantic seaboard. General inquiry remains heavy. The New York Air Brake Co. has asked for 10,000 to 20,000 tons of Nos. 1, 2 and 3 foundry for the remainder of the year. A southern Ohio steel plant still is active with a request for 10,000 to 20,000 tons of last half basic. The American Locomotive Co. has asked for 2000 tons of basic for plants in this country and at Montreal and for several thousand tons of foundry all for last half. Sales remain few as the furnaces have virtually nothing to offer. The embargo has been raised on southern iron which has been accumulating with some furnaces since November. Little relief is expected from this owing to inadequate car supply.

#### Last Half Tonnage Sold

Boston, April 8.—It is understood that a northern furnace has taken considerable business for last half, which presumably takes it out of the market for the balance of this year. The week locally otherwise, however, has been one of numerous inquiries, but with almost no iron available. Actual business has been small. Brokers and agents have literally been swamped with chances for business and an immense tonnage could have been turned over if nearby iron were available or the furnaces were inclined to book for last half. Present prices are to prevail only until July 1, and lacking any definite idea of what they will be after that date, makers naturally are not inclined to go freely into forward selling. The general report, however, is that deliveries are very much better than they have been. The shipments from northern furnaces are described as having been better in the past month or so than they have been before since December, while those handling Alabama irons also express complete satisfaction with the way shipments have come along recently. Deliveries, however, are entirely on government or embargo committee permits and it is noted that the Emergency Fleet corporation work is getting the call. The New Haven road has suspended the embargo against other New Eng-

land lines, which it established on March 23, but maintains the bars against freight from outside New England.

### Bessemer and Foundry Sold

New York, April 8.—Activity in the pig iron market during the past week was divided largely between foundry and bessemer. The Gould Coupler Co., Depew, N. Y., bought a good-sized block of bessemer for second half, and Stanley G. Flagg & Co., Pottstown, Pa., closed for a moderate tonnage of this grade. The large tonnage of bessemer originally sold to France, but held up at Atlantic seaboards due to inability to ship, now has been entirely disposed of, it is understood. Most of this was sold some weeks ago to the American Bridge Co. and the American Steel & Wire Co. Sales of southern foundry here during the week aggregated fully 7500 tons. Of this total, 3000 to 4000 tons are for second half shipment. The remainder is for immediate shipment, in a number of cases to consumers who under ordinary circumstances never have used southern iron. One New York state melter closed for 2000 tons and a New England melter for 1000 tons. As a result of better shipments to the north late, it is understood southern furnace stocks have been considerably reduced. Government permits for shipments are required in all cases and frequently the iron is being consigned direct to the government or army or navy officers. As a result, second half sales are being made only to melters doing urgent government work. A Virginia furnace has set aside second half tonnages to a number of its regular customers, but no sales are reported. Several northern furnaces also have shown slightly more freedom in taking on second half foundry. Two furnaces sold 1200 tons each to a central Pennsylvania consumer. A number of other second half sales of northern foundry are reported, totaling several thousand tons. The Essex Foundry, Newark, N. J., has not yet closed on 4000 tons of second half foundry. The Pennsylvania railroad, it is understood, shortly will place the remaining tonnage on its second half inquiry. The American Locomotive Co. is inquiring for 1500 to 1600 tons of basic for second half for Schenectady, Dunkirk, Pittsburgh and Richmond, and also is in the market for foundry.

### Sellers Few, Demand Large

Philadelphia, April 9.—A Buffalo maker who previously had booked extensively of second half foundry and malleable iron business and had added considerable tonnage to this total in this district during the week, now has withdrawn. A Virginia furnace has been active in making reservations in foundry iron for the last half of the year from its regular customers. Apart from these evidences, the market has remained restricted on the selling side with respect to standard grades of iron, although a heavy inquiry, much of which is going unsatisfied, continues to appear. The General Electric Co. has inquired for 10,000 to 11,000 tons, largely foundry iron and including 1700 tons of malleable for last quarter shipment to Lynn, Everett, Pittsfield, Schenectady and Erie. Numerous inquiries for second half foundry iron are current.

### Bessemer and Basic Sold

Pittsburgh, April 9.—Sales of two lots of bessemer iron by a valley maker to a Pittsburgh district consumer have been made at the revised government price of $35.20, furnace. One transaction involves 2500 tons for April-August delivery and the other 1500 tons for April-May shipment. This iron is to go into the manufacture of government requirements and the sales do not denote a loosening of the market. The shortage of steelmaking grades, especially basic, still remains acute. One of the consumers buying the bessemer iron has also closed for 3000 tons of southern basic for prompt shipment. Delivery of this basic is dependent on several contingencies, such as the securing of cars and the making of shipment at a specified time, and it is not certain that these conditions can be met. The buyer is in pressing need of the tonnages. The general committee of the American Iron and Steel institute will meet in New York on Thursday, when it probably will pass on the disputed point as to what is the base price of iron. Differences of opinion exist on this subject, but it is thought to be highly probable that the committee considers $33, furnace, is the base level which was originally fixed. No single grade or grades of iron, it is maintained, represent the base, although as it happens the price of No. 2 foundry was left unchanged at $33. With the question settled in this manner, it would be made clear that the only grades affected by price changes for the second quarter are bessemer and basic. The differentials on the silveries and the lower grades of ferrosilicon continuing as heretofore with $33 as the base. Scattering inquiries are being made for foundry grades. Makers are unable to take additional business and some are oversold for both the first and last halves. Operations of furnaces are further improved. The Carnegie Steel Co. has added two furnaces to its active list and now has 48 of 59 making iron. Consumers in increasing numbers who are engaged on government orders are appealing to Washington authorities to see that they are supplied with iron.

### Production is Pushed

Buffalo, April 8.—Operating conditions have improved slightly here, and makers are concentrating on the production end. Coke supplies are a little better and there is a slightly better car movement. Selling has almost entirely subsided. One maker has disposed of a considerable fixed tonnage for last half to regular customers. Most Buffalo furnaces are declining to assume contracts, though the inquiry is strong as ever. In most cases inquirers are not specifying given amounts but are asking for iron in any quantity. From present indications, it would appear that local furnaces would be able to do very little in the near future to counteract the famine of iron. At present it looks as if they would be out of the market indefinitely. One maker here states that he could sell 100,000 tons immediately if the iron was available. Two furnaces of one interest now going on hot metal will be turned into foundry the end of this month. This will give this interest four furnaces on foundry at that time. All shipments east are being shut down by embargoes except material for government use.

### Chicago Inquiry Less

Chicago, April 9.—With all producers in the Chicago district entirely sold for 1918 production, inquiry has lessened as melters have discovered their inability to obtain further tonnage from this source. Some increased tendency on the part of southern producers to take on last half tonnage has relieved the situation here and there, as local consumers have found it possible to place some business in the south. While southern sellers are not selling freely such tonnage as they now are offering is very welcome since it is badly needed by melters here. The leading producer in this district has taken into account in selling last half production, the probability of a tonnage now going to steel producers being released for other use, when a blast furnace now under construction is completed and put in blast. Every effort is being made by pig iron producers to make shipments in a way to serve melters to the best advantage and where a

foundry needs less than it had estimated, shipments are being reduced to the advantage of other users whose needs are greater than had been expected. This is having the effect of equalizing supply with demand and saving possible shutdowns for lack of material.

### Basic Famine in Evidence

Cincinnati, April 8.—Evidence of the scarcity of basic iron continues to be shown by the attempts of users of this grade to cover for their future requirements. A recent reported purchase of 6000 tons of southern basic by a steelmaker in this territory only partly satisfied the wants of the company in question. A southern Ohio consumer still is figuring on 10,000 tons for forward delivery. Basic has become so scarce that a future supply is a matter of deep concern with melters who have not provided for the entire year. It is rumored that a few basic makers are holding back on last half business so as to take care of their regular customers, but this does not seem to be borne out by reports from sellers that are undoubtedly reliable. Some southern off-grade foundry iron has been sold for the second quarter.

### Inquiry Piles Up Heavily

St. Louis, April 8.—In the aggregate the inquiry for pig iron at this center continues enormous. During the past week quite a formidable addition to the outstanding demand developed, and so far as could be gathered tonnages allotted on old or new inquiries were insignificant. While the shortage is acute, especially with smaller interests, it must be said that in the case of the more important users apprehension is more psychological than actual, as all are covered for some months to come. The scramble to secure iron, however, is general.

### Not Selling Freely

Birmingham, Ala., April 9.—Southern manufacturers of pig iron continue to hold off from the market and are not selling freely. Reiteration is to be heard that there is very little iron to be offered for the second quarter and that there is no reason for rushing last half business. A few sales are being made and regular customers are being given preference. Numerous inquiries are indicative of an open need for a large tonnage of iron. Expectations are entertained for some relief this week from the car shortage which recently caused an accumulation of iron on yards in this territory. It is estimated that upwards of 225,000 tons of iron are piled in this district.

# Coke Car Supply Improves

## Monongahela Road Shows 100 Per Cent Service, First in Nine Months—Washington Conference to Consider Distribution

Pittsburgh, April 9.—Marked improvement in the car supply in the Connellsville region has developed this week. On the Monongahela yesterday and today there was a 100 per cent supply for the first time in approximately nine months. For the entire region yesterday the average supply was 85 per cent. The average on the Monongahela last week was only 53 per cent. It is believed that the supply will continue at a good rate from now on. At different times recently good supplies were available, but after the cars were loaded and shipments made, difficulty was experienced in having the empties returned so that a low supply followed a satisfactory one, but it is hoped that this reaction will not recur. Most furnaces appear to be well supplied with fuel at present. No new contracts for either furnace or foundry coke are being made. Some operators are considering the idea of not making contracts after those now existing expire. It is pointed out that there is no real reason why they should, inasmuch as prices have been fixed and there is no advantage to the seller in making contracts. At the same time, operators say conditions as to shipments, government demands, etc., are so uncertain under prevailing conditions that they are not sure that they would be able to fulfill commitments. It is the idea of these operators that the most desirable way is to take care of their regular customers first as fully as possible and to supply new ones when they can Production during the week ended March 30 totaled 352,435 tons, as compared with 339,580 during the preceding week, according to *The Connellsville Courier*.

### Will Consider Distribution

Cleveland, April 9.—Representatives of coke interests in this territory will attend a meeting at Washington, Thursday, called by Coke Administrator Blauvelt, to consider matters in connection with coke distribution to northern Ohio consumers. As noted last week, the local by-product plant of the McKinney Steel Co. is to be called upon the furnish foundry consumers in this territory from the surplus of its by-product coke over its own needs. This latter is estimated at 600 to 800 tons daily. Much of this coke now is going to the local furnaces of the American Steel & Wire Co., but it will be freed for open consumption when the by-product coke plant of the latter company in this city is completed by the mid-year.

### Shipments More Active

Cincinnati, April 8.—In some fields reports are to the effect that laborers are working only about half time. Present wages enable them to loaf two or three days a week, should they desire to do so. Fortunately this condition does not exist throughout the coke producing districts, but it is one serious enough to invite the attention of furnaces whose output is dependent on a sufficient coke supply. It is generally understood that Pocahontas and Wise county furnace and foundry cokes are based on $8 per net ton at ovens. The supply from these districts is behind scheduled shipments but the fuel is moving much more promptly than at any time for the past six months.

### Shipments are Maintained

St. Louis, April 6.—Receipts on coke contracts here during the past week were on a parity with the week before when about 70 per cent of normal was the estimated average. Efforts on the part of dealers to get tonnages through to customers in the west and southwest are meeting with a shade better success. Production of by-product coke in this district is on a large scale, and the leading ovens are doing much to help out the stringent situation. Coal has been moving across the Mississippi in large quantities, relatively, thus permitting of intensive coking operations and prompt deliveries. Fair tonnages have been quietly sold outside the district. Leading dealers report that ovens in the Connellsville district are offering nothing and spot foundry coke is out of the question. Southern producers are entirely out of the market.

### Production is Improving

Birmingham, Ala., April 9.—Continued improvement in production of both coal and coke are noted in the Birmingham district. There is still need for more coke and also coal. The announcement the past week that the Tennessee Coal, Iron & Railroad Co. would begin immediately the construction of 154 Koppers by-product coke ovens was favorably received.

# Commission Ruling Nears

## Petitions From Consumers About to be Laid By Institute Before Price Board—Contract Revision Being Combated

FOR COMPLETE SCRAP PRICES SEE PAGE 954

Philadelphia, April 9.—About 100 petitions signed by consumers and asking that a commission be granted to dealers have been received by the American Board of Scrap Iron Dealers. It is expected these will be submitted shortly to the price fixing committee of the war industries board by representatives of the general steel committee of the American Iron and Steel institute, of the subcommittee on scrap and of the board of dealers. The American Board of Scrap Iron Dealers has taken exception to the ruling of the general institute committee regarding the revision of unfilled contracts April 1 where deliveries were prevented by causes beyond the control of the sellers. The dealers construe this interpretation is not in accord with the President's price announcement. Appeal along this line is to be made by the dealers to the price fixing committee. It is understood that the general institute committee already has outlined these protests to the price fixing committee. The Alan Wood Iron & Steel Co. has purchased 10,000 to 12,000 tons of heavy melting steel at $29 delivered with the understanding that the commission will be paid if allowed. Otherwise the market is quiet. All grades are plentiful except railroad and yard wrought and shafting. Shipping conditions are improving. The embargo against the Lukens Iron & Steel Co. has been lifted.

### Local Movement Satisfactory

Boston, April 8.—A fairly good demand is reported for scrap and while shipments to distant consuming points are still very much hampered by the railroad embargoes, there is a fairly satisfactory local movement and in the lack of big supplies the market is quite firm. Cast scrap does not appear to be in very big demand, except from local users. Wholesale dealers' paying prices per gross ton, f.o.b. cars, shipping points, follow: Wrought No. 1 yard long, $29 to $29.50; horseshoes, $29 to $29.50; cotton ties, $21 to $22; stove plate, $19 to $19.50; No. 1 machinery, $31 to $32; No. 2 machinery, $27 to $28; car axles, iron, $42 to $43; steel, $42 to $43; re-rolling rails, $30 to $31; iron boiler plate, $33 to $34; bundled barrel hoops, $16.50 to $17.50; wrought iron pipe, new specifications, $28 to $29; steel rails, $25.50; No. 1 railroad steel, $25.50; heavy melting steel, $24.50 to $25; axle turnings, $20 to $21; machine shop turnings, $14 to $15; cast borings, $15 to $16; drop forge trimmings, $22 to $23; cast iron car wheels, whole, $27; broken, $31.

### No Advice on Commissions

Pittsburgh, April 9.—No ruling that dealers and brokers in scrap cannot be allowed a commission on sales to consumers has come officially to the notice of the trade here. Sellers say that in any event they will continue to press their argument before the war industries board for a commission supported by petitions signed by users. Some of them assert the denial of the commission virtually will force them out of business. The decision of the institute committee that consumers may pay the maximum prices plus the freight differentials between their plants and the nearest competitive buying points is welcome news. This would meet fully the contention that has been made by Pittsburgh dealers and users ever since scrap prices were regulated by the government. Since the Pittsburgh district consumes more scrap than it produces, it has to rely on outside sources for part of its tonnage, but with prices fixed uniformly on the delivered basis the tendency is for material to move to the nearest point of consumption because of the lower freight rates. Since freight differentials may be paid, Pittsburgh consumers will be able to get increased supplies by paying the higher charges. Supplies of consumers are running low. Material for operations has been secured largely by means of direct buying between consumers and producers and through shipments on old contracts. Malleable and No. 1 scrap are weak at and appear quotable at $32 and $33. It is doubtful if heavy melting steel can be bought for less than the new maximum of $29. The proposed readjustment in classification may involve slight reductions in malleable and No. 1 cast according to reports received here.

### Trading is Confused

New York, April 8.—The announcement that scrap consumers unfavorably located can pay in excess of the government maximum an amount equivalent to their freight rate disadvantages is receiving wide attention here. This ruling will afford particular relief to the consumers in the Pittsburgh district who have found it difficult to obtain material from the eastern producing centers, as dealers found it to their advantage to sell nearby. Trading has been somewhat retarded during the past few days due to the confusion among buyers and sellers over the question of commissions. Last Friday it was announced that the 3½ per cent commission would not be allowed dealers and brokers. Later it was rumored that the decision of the scrap committee in this regard had been changed. It now appears, however, that the original ruling holds. As a result, scrap dealers now are petitioning the war industries board. With the exception of cast scrap and stove plate, the market is quiet. Prices are unchanged.

### Melting Steel is Short

Buffalo, April 9.—A pronounced shortage of heavy melting steel remains and this has led to the use by consumers of bundled sheet scrap instead. The consequence has been an increase from $21 and $23 to $24 and $25 in the price of bundled sheets. The shortage may be still more pronounced in the near future because of the ruling which allows Pittsburgh and consuming centers to pay the regular price plus a differential by obtaining a permit from the chairman of the subcommittee on iron and steel scrap of the American Iron and Steel institute. The probability is that this will result in some of the scrap from sections tributary to the Buffalo district, going to Pittsburgh instead of its natural destination. Little scrap, it is predicted will leave Buffalo district proper, though. The demand is good for stove plate and the price has gone from $24 to $25 and $26. Car wheels are scarce. Consumers say it is impossible to buy at the government price of $29. The cost of breaking amounts to from 60 to 75 cents a ton and broken car wheels under the classification of cast scrap command a $34 price. The car supply has improved.

### Dealers Are Bewildered

Cleveland, April 9.—Uncertainty marks the scrap iron and steel business in this district. Dealers regard unfavorably the statement of the American Iron and Steel institute that the $1 reduction applies to unfilled contracts as well as second quarter business. They point out that widespread disturbance may follow such an abrogation of contract prices. Speculation is less rife concerning the 3½ per cent commission, dealers having heard so

many false reports they are only willing to accept a formal and final decision. Little attention is paid the extra charge that may be paid for scrap on account of freight inasmuch as this has little effect in this territory. Stove plate has become a drug on dealers' hands here, and the price is lower. No. 1 cast, cupola size, is less firm. A New York Central scrap list, the first in several months, closes April 10. Considerable interest is manifested in the meeting here April 15 of the central division of the American Board of Scrap Iron Dealers at Hotel Statler. C. A. Barnes, Philadelphia, and Daniel Cohen, Chicago, are expected to speak.

### Chicago Market Disturbed

Chicago, April 9.—Recent developments in the scrap iron and steel market, notably the refusal of a commission or compensation for the dealers' services, have unsettled the scrap market considerably. Trading is only moderate and most consumers are not actively seeking further supply. Somewhat more tonnage is coming out than has been the rule, holders of scrap apparently feeling that prices will not be higher and that they might as well unload. The effect of this has been to increase offerings somewhat and prices are a trifle weaker on a number of grades. Apparently railroads have not been holding back their scrap as offerings from this source are not materially increased. The Santa Fe is offering 2300 tons, and the Union Pacific 1600 tons. Acute shortage of steel rails for rerolling continues to be met.

### Dissatisfied With Rulings

Cincinnati, April 8.—Dealers are up in the air owing to various rulings by the general committee of the American Iron and Steel institute which have unfavorably affected them. The partial solution of the commission matter has been succeeded by another question that involves the allowance of freight differentials.

### Users Favor Commissions

St. Louis, April 8.—Both dealers and consumers have rapidly adjusted themselves to the $1 price cut and the effect on this market has been slight. The main topic among consumers and dealers is commissions.

### Watching Future Prospects

Birmingham, Ala., April 9.—The scrap market in the south is doing nothing more than holding its own; in fact there is a belief it is a little weaker. It is true however the government maximum price on various grades never has been reached. The home demand is awaiting the future.

# Shell Demand Tremendous

## Government Allots 1,200,000 Tons of Steel—Canada Gets 115,000 Tons—Total Needs for 1918 Over 4,000,000 Tons

New York, April 10.—Orders for tremendous quantities of shell steel aggregating approximately 4,030,000 tons in billets and rounds are being whipped into shape by the United States munitions department for distribution among the various mills. This tonnage includes Italian, French, Canadian and British allotments and is to be rolled between now and Dec. 31, 1918. It is to be used for the production of 4.7, 6, 8 and 9.5-inch and 155-millimeter shells. About 1,200,000 tons now are being allocated among various mills by the government for its own use. It is estimated the government will also allot 1,300,000 tons later. In addition, 115,000 tons of billets which already has been placed, partially with mills in the Pittsburgh and nearby districts, will be shipped to Canada to be forged.

The French requirements this year are placed at 650,000 tons; the Canadian, in addition to the 115,000 tons, placed at 75,000 tons; the Italian, at 40,000 tons; and the British, at 350,000 tons. In addition to the latter quantity, the British have 300,000 tons now under allocation. Mills working on shell-steel contracts have been told to speed up production and if necessary to convert every pound of open-hearth material into shell steel. This may cause some realignment of present finishing operations in order to meet the schedule of shell steel deliveries. The question has been raised whether there is sufficient forging capacity in the country to take care of this tonnage of steel for shells.

An interesting point in connection with the abrogation of shell steel prices has been made recently. One ally, through the British, ordered from a mill near the Pittsburgh district approximately 1000 tons of 5-inch shell rounds. The order was placed previous to the fixing of prices by the government. Following the recent price adjustment, the buyer requested the company to cancel the tonnage on account of the contract price being higher than the present fixed level. This the company refused to do and took the matter up with officials at Washington. The outcome of the matter was that the contract price has been held valid.

### Discards are Offered

Philadelphia, April 9.—The only semifinished material offered plentifully at present is shell steel discards. A Buffalo mill has been offering large tonnages. A middle western producer who has been in a position to market a round tonnage of forging billets is understood to have sold this material. Other sales of semifinished principally are in small lots of rerolling billets. One eastern consumer wants 5000 tons of billet blooms.

### Unable to Get Steel

Pittsburgh, April 9.—Enormous requirements for shell steel for this government and the allies for the last half of the current year are involved in the program which is said to have been worked out by the government. The total quantity included in this program calls for not less than 4,000,000 tons of shell steel, and it is believed that distribution about to be made will represent between 2,500,000 and 3,000,000 tons. It is reported that the distribution of this tonnage for this government and the allies has been partly determined upon and that for Great Britain will be forged in Canada. The actual production of the steel itself does not appear to be as great a problem as that of finding the necessary forging capacity in this country. Pressing inquiries continue to come to makers and sellers of sheet bars, but are not so numerous as they have been, simply for the reason that consumers realize that it is impossible to cover requirements. No offerings are being made and sales are extremely limited. The output has increased and some makers are hoping that toward the end of the present month they will be able to take new business. Manufacturers of sheets and tin plate are suffering considerably from a shortage of sheet bars. Inquiry for billets is active but not so much so as it is in the case of sheet bars. No billet tonnages appear to be available. A platemaker in this district has taken 6000 tons of slabs from a broker.

### Strip Market Quiet

Pittsburgh, April 9.—Quietness continues to characterize the market for cold rolled strip steel. Demand by the automobile trade is expected to develop soon inasmuch as supplies on hand are understood to be almost depleted. Stocks which have been piled by manufacturers have been reduced somewhat owing to the improvement in the supply of cars.

# Large Rounds Selling High

**Transactions in East Closed at 4.00c to 6.50c, Mill or Well Above Fixed Prices—War Bar Demand Large**

Philadelphia, April 9.—The most noteworthy feature of the bar market in this district is the selling of large rounds ranging from 4 to 7 inches above the government price. One mill has been disposing of this material at 3.50c, mill, which is the fixed government price for 5 to 7-inch sizes, but most sellers hold for a minimum of 4c and as high as 6.50c is being done. Forged or pressed rounds up to 12 inches in diameter are bringing as high as 8.50c. On smaller than 4-inch sizes the government bar price of 2.90c is being observed. The Donner Steel Co. continues to sell in the open market steel bars up to 1⅞ x 6 inches.

### War Demand Heavy

Chicago, April 9.—Western mills continue to receive heavy allocations of steel bars, both hard and soft, for reinforced concrete work, for shell rounds and for shipbuilding. While the tonnage of bars is not as heavy as of plates and shapes, it presents a total as large as mills can accommodate and seems likely to grow larger as time passes. With the govment in control of railroad buying, comparatively little domestic demand remains outside government requirements and practically all consumers are using the material for war purposes. Bar iron mills continue to take contracts for immediate shipment at about the same rate as their production and practically all business is filed with specifications accompanying orders. Demand for hard steel bars is heavy and rerolling mills producing this material from old rails find they cannot take on all the business which offers. Some offset to this condition results from the ability of several steel mills to produce considerable tonnage from bloom and billet discards and also from "secondary discards" which are required in the making of shell rounds. This steel is of proper analysis for hard bars and is of high quality although rejected for shell-making purposes.

### Mill Operations Increase

Pittsburgh, April 9.—Operations of mills making soft steel bars have increased considerably and shipments have improved. Makers are not taking much new business, however, but expect to be able to do so soon. They will be called upon to take a large tonnage in connection with the car-building program and the implement trade is beginning to show increased interest in the market.

### Inquiry Holds Good

Buffalo, April 8.—There is good inquiry for bars before mills of this district. One inquiry is for 1000 tons. Growing scarcity of cold rolled steel over 2 inches is noted. Some users are utilizing forgings by turning them down to suit their purposes. Large rounds are hard to get as the government is taking almost all the mills produce.

### Big Bolt Inquiry Reappears

Cleveland, April 10.—Revised specifications having been issued, the government again is receiving bids upon the lot of 100,000,000 bolts for the quartermaster's department. This inquiry originally came up several weeks ago and was withdrawn.

### May Enlarge Bolt Inquiry

Chicago, April 9.—A recent inquiry from the government for more than 10,000,000 bolts and nuts, which was being figured on a week ago, has been withdrawn temporarily with the suggestions that it will be reinstated later after considerable additions have been made to meet a wider program. It has been rumored that this list and others which may accompany it when it is revived may total close to 100,000,000 bolts. No other large business has been current recently.

### Recommend No Price Change

Pittsburgh, April 9.—At a conference held last Wednesday in New York by manufacturers of nuts, bolts and rivets, it was concluded that no change should be made in the prices on their products and recommendation to this effect has been submitted to the committee on steel and steel products of the American Iron and Steel institute accompanied by cost sheets to support the contention of producers. It was claimed that if any change were to be made it should be upward instead of downward, the price of 2.90c, Pittsburgh, on steel bars affording only a moderate profit for makers of nuts, bolts and rivets, it was maintained. Operations of producers are estimated at about 80 per cent of capacity, having been increased as a result of the improved supply of cars and of steel. A great portion of orders on hand are for the government either directly or indirectly. Shipments on regular commercial requirements are being given in from 30 to 60 days, while on special business they are deferred from 90 to 120 days.

### Fair Demand for Hoops

Pittsburgh, April 9.—Fair demand exists for hoop steel and comes from miscellaneous interests, particularly makers of oil barrels. The market for bands is dull and manufacturers are not soliciting business and consider the price of 2.90c unattractive. Producers of strip steel, hoop steel and bands continue to await the announcement by the committee on steel and steel products of the American Iron and Steel institute regarding the adoption of a single base price and differentials to cover all these products.

### Fair Demand for Shafting

Pittsburgh, April 9.—Demand for cold rolled shafting is fairly active, considerable portion of which comes either directly or indirectly from the government. Less inquiry exists for smaller sizes, shipments on which are made in 60 days. Larger sizes are being used for the production of munitions. Shipments on commercial requirements are deferred from three to four months. The machinery trade is buying fair-sized lots but purchases by the screw stock trade are light.

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# Car Orders

**By the Government Still Awaited—Builders in Washington**

New York, April 9.—Car builders are in Washington, discussing the allotment of the large government order for freight equipment. Everything else in the equipment market hinges upon the decision about to be made in connection with this project. The American Locomotive Co. has received an order from the Central Railway of Brazil for six locomotives.

### No New Rail Bids

Pittsburgh, April 9.—Makers of standard steel rails are committed on contracts for the remainder of the current year and are not quoting on 1919 requirements. Producers here say they have no knowledge as to the requirements that will be necessary in connection with the government's railroad building program, nor do they know what the government proposes to do in the way of fixing prices on rails. It is assumed, however, that levels will be established and that tonnages will be allocated among various mills. Demand for light rails is only moderate and shipments can be

made promptly. Some makers have piled stocks of sections from 25 to 45 pounds. Producers of small spikes in this district are heavily committed on contracts and have withdrawn from the market. Deliveries are deferred from four to five months. Numerous small lots of standard spikes are being sold and shipments now are promised in from four to eight weeks by some producers.

### Await Government Order

Chicago, April 9.—Builders of railroad cars and mills furnishing the steel necessary for their construction are awaiting distribution of the government order which has been pending for some weeks. It is understood bids have been asked on 100,000 cars of various types, which are expected to require 1,250,000 tons of steel for their construction. No other car inquiry is current.

Only small lots of standard steel rails are being sold, but light rails are being contracted at about the same rate as production. These are required for mining and lumbering operations and for export.

## Allot Wire

### For Italy to Different Makers—Navy Nails Still Open

Pittsburgh, April 9.—The government has allocated the 60,000 tons of barbed wire wanted for shipment to Italy, the distribution having been made among three or four producers, it is reported. Shipments are to be made at the rate of 10,000 tons a month so that delivery will be completed within six months. So far as known, awards have not been made by the bureau of supplies and accounts, navy department, for the 40,000 kegs of nails for which it opened bids last Tuesday. Bids were submitted on a delivered basis to navy yards. The recommended level of $3.50 per 100 pounds, Pittsburgh, is said to have been named by manufacturers plus the freight rates to the yards and the freight war tax. It is reported that a valley producer will get considerable portion of the tonnage. Some makers are entirely out of the domestic market, and report that specifications are coming in in greater volume. Others are entertaining inquiries which come from regular customers exclusively and are able to take only part of their requirements. Nails and plain wire are in active demand.

The Victoria stack of the Southeastern Iron Corp., Goshen, Va., was blown out on April 1.

# Speed Plates to Britain

### Orders Placed by Government for Ally Are to Supersede All Others—Big Lake Vessel Order Expected

Philadelphia, April 9.—Orders for ship plates for England which recently have been distributed among practically all eastern mills, have been ordered by the government to supersede all other bookings. The total amount of this tonnage, while not given, is known to represent a large figure. The government apparently is very anxious that there be no delays in the filling of this order and the mills have been given to understand that urgent delivery is desired. The Emergency Fleet corporation has placed considerable additional tonnage of ship steel among eastern producers. The Reading railroad has been the purchaser of several thousand tons of plates. The general demand for plates remains very large but eastern mills are turning practically all of this away as they are unable to book any tonnage without a priority order.

### Expects Big Ship Order

Cleveland, April 9.—While no formal orders as yet have been placed, it is understood that the American Shipbuilding Co. will receive contracts for probably from 80 to 100 vessels from the Emergency Fleet corporation for 1919 delivery. These contracts will keep the company's capacity fully engaged after the present orders are completed. This lake builder has speeded up its operations so that it now is turning out a completed vessel on an average of every 3 days and 5 hours. Local plate mills continue to operate on practically nothing but Class A orders. It is difficult to get steel for other than war purposes.

### Demand Exceeds Production

Chicago, April 9.—Government orders for steel plates, principally for shipbuilding purposes, continue to be allotted to mills in this district in large quantity. Plates are sought for in excess of other finished steel products and the tonnage now being placed is much above productive ability of mills. These plates are mostly for shipbuilding. Some are being shipped to bridge shops and others to shipbuilders who do their own fabricating. One tonnage of 18,000 tons was placed in this district late last week.

### Wait for Car Orders

Pittsburgh, April 19.—Car builders in this district are hoping that the government soon will have distributed all the cars it is understood it will order in connection with the first allotment that is to be bought. The heavy plate tonnage required for these cars will further tax mills which have been urged to hasten production and shipments. All of the larger mills are heavily committed and are making no offering to private consumers. Some of the smaller makers are well caught up on contracts and unless orders are forthcoming soon, probably will be actively soliciting business. The Pressed Steel Car Co. has taken 100 car bodies for the Newburgh & South Shore railroad.

## Reduced Output

### Caused in Tin Plate by Steel Shortage—Shipments Good

Pittsburgh, April 9.—Operations of tin plate mills were reduced last week owing to a shortage of sheet bars, a sizable tonnage of which was diverted at the request of the government. Shipments of tin plate were made at a good rate but at the cost of output, employes having been taken temporarily from tin mills and the pickling department to supplant those who had not returned after the Easter holiday. One large producer is suffering considerably from a shortage of cars and has been compelled to operate at a low rate. It still is necessary to get permits to make shipments to the east where embargoes are in effect, including the large plant of the Continental Can Co., at Syracuse, N. Y.

## Freight Embargo Hampers

Boston, April 8.—Conditions with local jobbers in steel and iron products are much as they have been for some little time past. Demand from concerns directly or indirectly engaged on government work is good, but demand for goods for domestic use continues very slow. Deliveries from the mills are reported better, thanks to favorable weather conditions and improvement in the railroad situation. The movement, however, is not entirely normal and probably won't be until the New Haven takes off its present embargo on outside freight.

A voluntary increase in wages averaging 25 cents per day as of April 1, has been granted its 100 employes by the Empire Knife Co., Winsted, Conn.

# More Ship Steel Wanted

**Eastern Yard About to Place Large Additional Fabricated Tonnage—Seek Huge Number of Angles for Wire Posts**

New York, April 8.—It is understood that the American International Shipbuilding Corp., Philadelphia, is preparing to take bids shortly on the fabricated steel for 16 additional steel vessels. One of the features of the structural demand here is the predominance of railroad new construction requirements. The Pennsylvania railroad is inquiring for four small bridges and five signal bridges, involving 300 to 400 tons of steel. The Delaware, Lackawanna & Western railroad has inquired for about 900 tons for a breaker. The Central Railroad of New Jersey awarded 250 tons to the Phoenix Iron Co. for a power house at Jersey City, and there have been smaller orders. Progress continues to be made on the war department's plans for establishing large storage warehouses at various eastern ports. The department will take over waterfront at Bay Ridge, Brooklyn, for a $25,000,000 warehouse, but details of building plans have not been announced. Demand for plain shapes is exceedingly slow and is almost entirely in small tonnages from stock for warehouses and fabricators. Export demand, which has been quite plentiful, has fallen off almost entirely, due probably to inability of the buyers to obtain export licenses.

### Heavy Tonnages Being Placed

Pittsburgh, April 9.—Fabricators report that heavy tonnages for various kinds of construction are being placed by the government. It is understood that fabricators who have been awarded with contracts for hangars for France, and who are in the market for turnbuckles, have covered their requirements. One fabricator in this district who was in the market for 2,500,000 turnbuckles is said to have secured them. Makers of steel are being pressed harder for shipments to fabricators in order to hasten the shipbuilding program. The fabricated material will be moving to shipyards soon, and there is a question in the minds of some as to whether or not the shipbuilders can handle it as fast as it arrives. The car-building program will require an extremely large tonnage of shapes, but the exact amount has not been made known.

### Many Wire Posts Needed

Cleveland, April 9.—War contracts are calling for miscellaneous lots of structural material, some of them of tonnage size, for a wide variety of purposes. An interesting inquiry current in this district this week calls for 500,000 1¼-inch angles in lengths of 3 and 6 feet representing about 3800 tons for use as posts in connection with barbed wire entanglements for the army. Another inquiry calls for material for 3000 gun carriages which are to be supplied by an automobile builder in northern Ohio. The shapes and plates for 30 gun foundations also are called for. The demand for material for tractors is brisk and some good-sized orders for large angles and channels were placed with Pittsburgh mills during the week. The McMyler-Interstate Co. is in the morket for the steel covering a government order for 28 locomotive cranes.

### Ships Take Most

Chicago, April 9.—Although demand for structural shapes for building purposes is at a minimum, shape mills are receiving sufficient tonnage to cover their production and in some cases it is in excess of their capacity. Most of this material goes to shipbuilders, although some is being used for government construction and an occasional tonnage is taken for railroad or mining needs. The only tonnage placed in the west recently involves 455 tons for bridges in Idaho, which will be fabricated by the Illinois Steel Bridge Co.

#### CONTRACTS AWARDED

Power house for Jersey Central railroad, at Jersey City, 250 tons, to Phoenix Iron Co.

Substation for Jersey Central railroad at Jersey City, 100 tons, to Eastern Steel Co.

Five 200-foot spans for the state of Idaho, at Clark's Fork, Idaho, 455 tons, to Illinois Steel Bridge Co., Jacksonville, Ill.

Large tonnage for DuPont powder plant at Nashville awarded to Belmont Iron Works.

Grain tanks for Sperry Flour Mills, Tacoma, Wash., 500 tons, Palmer & Peterson, 681 Market street, San Francisco, awarded general contract.

Elevator and warehouse for the L. Teweles Seed Co., Milwaukee, 810 tons reinforcing bars and other steel to the Interstate Iron & Steel Co. Fraser Co., Milwaukee, supervising engineers.

#### CONTRACTS PENDING

Bridges and miscellaneous requirements of Chesapeake & Ohio railroad, 1400 tons, bids being taken.

Central power station for government at Washington, 700 tons, revised bids being taken.

Warehouse for the war department at Bay Ridge, Brooklyn, to cost $25,000,000; tonnage indefinite. Government is taking over land.

Bridges for Pennsylvania railroad, about 300 to 400 tons, bids being taken.

Government building at Washington, 1400 tons. A. E. Norton & Co. low bidders.

# Active Demand

**In Ferro and Spiegel—Higher Sales Made Accept New Standards**

Pittsburgh, April 9.—Numerous inquiries for sizable tonnages of spiegeleisen have come to producers and sellers in this district. Some consumers are still asking for the 20 per cent grade, tonnages of which are extremely scarce and quotations now are being made strictly on the basis of the new 16 to 18 per cent standard, which is quoted at $70, furnace, either for second quarter or last half. One inquiry for 18 or 22 per cent spiegeleisen calls for 900 tons for third quarter, another for 500 tons for second quarter, while a third is for 500 to 1000 tons for second half. Spiegeleisen above 18 per cent is quoted at $3.50 per unit, making the price of 20 per cent $77, furnace. The market for ferromanganese is only moderately active. One consumer is seeking 1000 tons of 40 to 50 per cent for last half which is quoted at $3.50 to $4 per unit, delivered. Under the new standard 70 per cent ferromanganese is quoted at $250 with a price of $4 per unit over that amount, making 80 per cent quotable at $290, delivered, for prompt shipment. Consumers are apparently well covered for the first half. Fair inquiry exists for 50 per cent ferrosilicon, of which there also is scarcity. This grade for second quarter shipment is quoted at $170, and for last half from $155 to $160, delivered.

### Accept Changed Standards

New York, April 8.—The proposal to reduce the number of units of manganese in standard ferromanganese and spiegeleisen to 70 and 16, respectively, will be accepted without protest by the greater portion of the trade. Present indications are that the change in the standards is recognized as necessary in order to permit more extensive use of domestic ore and a consequent saving of vessel tonnage to bring in foreign manganese ore. Expectations are that a few consumers will claim 80 per cent ferromanganese is required in their practice. Producers, however, will ask a premium for all units in excess of 70 per cent and 16 per cent, respectively. The current belief is that this premium will range from $3.50 to $4 per unit. From the seller's standpoint, the market has been adjusted to the new standards. Standard 70 per cent ferromanganese now is quoted at $250, delivered, and 16 per cent

spiegeleisen at $70, furnace. These quotations apply to all deliveries.

Numerous inquiries for spiegeleisen are out, the largest involving 1000 tons for second half. The Whittaker-Glessner Co. have bought 500 tons for May-July shipment which was purchased before the raise in price. Before the application of the $250 price to 70 per cent ferromanganese a large amount of tonnage was booked for delivery throughout the year. This included forward requirements of the McKinney Steel Co., the Pittsburgh Steel Co. and others, who bought 80 per cent metal at $250. Negotiations now are on for a comparatively large tonnage of English 78 to 80 per cent ferromanganese for second half. The prospective buyers have offered to pay higher than the prices at which this metal previously had been sold during the past few weeks. The Andrews Steel Co., Newport, Ky., is reported finally to have closed for its 50 per cent ferrosilicon requirements over the second half at $155, delivered. Numerous inquiries are out for this metal for nearby delivery. The market on second quarter is quoted at $170 to $180, delivered. It is understood that the proposal to fix the price of 50 per cent ferrosilicon has been dropped.

### Sell at Higher Price

Cleveland, April 9.—Sales of 78 per cent ferromanganese for shipment by July has been made in this district at $282 delivered. This is on the basis of $250, delivered, for 70 per cent, with $4 for each extra unit. It represents a recent advance of $32 for this grade. Recent sales of all grades of various positions in this territory total 2000 to 3000 tons. Spiegeleisen inquiry also has been brisk, totaling several thousand tons and there have been several sales. Prices are at $80, furnace, for 19 to 21 per cent.

### New Basis in Effect

Chicago, April 9.—A virtual increase of $40 per ton for ferromanganese has resulted from the change in basis from 80 to 70 per cent with an additional charge of $4 per unit for manganese over 70 per cent. The prevailing quotation on 70 per cent manganese is $250 per ton at the furnace, with $4 per unit of manganese for higher analysis. The base price is the same as prevailed on the basis of 80 per cent manganese. Inquiry continues excellent and the local maker, having disposed of the greater portion of its 1918 production, seems likely to be sold out in a short time if the present indications of early business maintain.

# Need Great Sheet Tonnage

**Government Requirements About to be Distributed Placed at 70,000 Tons—Camp Kitchens and Stoves Call for Large Quantities**

Youngstown, O., April 10.—Reports are current in the Mahoning valley district that the government is about to place orders for a tremendous tonnage of steel sheets to be used for camp kitchens, box cars and other purposes. While inquiries have not as yet been received from Washington, it is understood the aggregate will be close to 70,000 tons. This will be one of the largest orders ever placed among the mills in this country. A large per cent of the production of galvanized sheets of one valley mill is being fabricated by the Trussed Concrete Steel Co. of this city into shelter houses. Angle iron, strips and braces are riveted onto the sheets so that little time is required in erecting the houses in this country and France. The government has been buying steadily, but not in as large quantities as heretofore. Orders ranging from 15 to 50 tons for mostly galvanized come out from time to time from both the army and navy departments. The majority of the mills is working largely on federal contracts and is not inclined to accept new business. One valley producer has several tons of various sizes and gages of galvanized sheets up for resale. These originally were rolled for export but shipment was deferred on account of embargoes. They are offered for sale at this time to allow for more storage space in the producer's warehouse. Good inquiry from the domestic trade has appeared right along for various grades of sheets but only distant deliveries are promised. One mill remains sold-up for the second quarter as far as galvanized business is concerned.

### No Improvement in Output

Pittsburgh, April 9.—No improvement was made during the past week in the output of sheets in this district. Operations are restricted on account of a shortage of cars and steel and shipments are not moving at a satisfactory rate. Not much headway is being made in reducing stocks which have been piled in warehouses. The production of sheet bars is increasing, however, and it is believed that sheet mills will be able to increase operations soon. Extremely large government requirements are being placed and mills are so heavily committed that they are taking practically no new business from domestic consumers. Deliveries are being made in from 30 to 90 days, depending upon the grades wanted. A middleman is offering 1000 tons of one-pass cold rolled sheets of gages Nos. 20 to 26, inclusive.

### Stove Sheets Placed

Cleveland, April 9.—A northern Ohio stove manufacturer who inquired last week for 35,000 blue annealed No. 14 sheets and for 13,000 galvanized sheets for portable stoves for cantonments, has placed this business. This buyer now has a new inquiry out for 35,000 to 40,000 Nos. 10 and 14 black and blue annealed sheets for similar

# Great Tonnage

**Of Cast Pipe Wanted by Waterbury, Conn.—Makers Consider Prices**

New York, April 9.—An inquiry for 32,000 tons of 42-inch cast iron pipe for water works construction at Waterbury, Conn., has been issued. This is the largest inquiry that has come out of the east for many months. Bids are to be closed in two weeks. Inquiries recently have been put out for several thousand tons for shell loading plants of the T. A. Gillespie Co., Perth Amboy, N. J., and California Loading Co., High Bridge, N. J. Both plants still are in the market for tonnage. The government soon is to inquire for several hundred tons additional for naval station at Pelham Bay. Binghampton, N. Y., closes bids tomorrow on small tonnage of 6-inch. Manufacturers of cast iron pipe are meeting in Philadelphia today to discuss a probable revision of prices.

### Requirements are Scrutinized

Pittsburgh, April 9.—Owing to the heavy demand being made upon them, manufacturers of pipe are carefully scrutinizing requirements so that they may be able, so far as possible, to take care of their regular customers. Demand for lap weld iron and steel pipe coming from oil country interests is especially heavy and some makers are entirely out of the market.

### Western Inquiry Slack

Chicago, April 9.—Western cities evidently are following the government's suggestion that improvements be kept down as low as possible and are not going into the market for cast iron pipe. The only new letting now in prospect is at Twin Falls, Idaho, where bids will be opened April 18 on 900 tons.

# Urge Revised Casting Specifications

## Steel Foundrymen Recommend to Government Raising of Phosphorus and Sulphur Limits and More Progressive Inspection Methods in Order to Increase Production to Degree Required by War Work

WASHINGTON, April 8.—For the purpose of increasing immediately the production of steel castings for the various departments of the government, the Steel Founders' Society of America has addressed a communication to the various purchasing bureaus which suggests increasing the sulphur and phosphorus content in existing specifications. For many months steel casting manufacturers have besieged Washington with requests for a slight increase in the maximum phosphorus limit, but have been unable to obtain government action. The manufacturers have contended that they are unable to comply with the phosphorus requirements of 0.05 per cent owing to the scarcity of low phosphorus pig iron and scrap. Producers of side-blow converter castings claim it is impossible to remain within the limits of 0.05 per cent sulphur owing to the high sulphur content of the coke available today for melting the iron in the cupola before it is charged into the converter for blowing into steel.

### Steel Foundrymen Act

The Steel Founders' Society of America has a membership of approximately 175 steel casting plants in the United States and through a committee consisting of L. E. Thomas, chairman, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.; H. E. Field, Wheeling Mold & Foundry Co., Wheeling, W. Va., and W. D. Sargent, Bayonne Steel Casting Co., Bayonne, N. J., it has recommended to the government that specifications for steel castings be so revised as to allow a maximum of 0.08 per cent sulphur and 0.07 per cent phosphorus in castings made by the Tropenas or side-blow converter process and an increase in the permitted sulphur content in castings manufactured by the open hearth process to 0.06 per cent phosphorus and 0.06 per cent sulphur. The specifications of the American Society for Testing Materials on Class A castings made by any process, which are not to be annealed, provide for a phosphorus maximum of 0.06 per cent and on Class B castings to be annealed, the phosphorus and sulphur must not exceed 0.05 per cent. In the statement compiled by this committee it is claimed that manufacturers no longer are able to guarantee lower phosphorus and sulphur limits and that most of the purchasers of steel castings, including the leading trunk line railroads, have already agreed to these increases in whole or in part.

### Increasing Production

To speed up production which today is being greatly retarded by faulty, inexperienced and critical inspection, the establishment of a central inspection bureau for all branches of the government is recommended. This plan, if fully carried out, would make it possible for the government to handle steel casting inspection with a much smaller force and would permit the employment of inspectors trained in this particular class of work.

Another cause of great delay not only in the production of steel castings, but also in testing them, it is pointed out, is due to the fact that most of the government departments demand individual tests of castings whereas for commercial use heat tests serve the purpose. The only difference in test results of steel castings from one heat would be in the annealing and it is recommended, therefore, that if more than one heat is represented in an annealing charge one tension and one bend test shall be made from each heat. The annealing shall be determined by the use of annealing test lugs which should be attached to important castings when specified in advance and may be broken off by the inspector to examine the grain. These annealing lugs shall consist of small pyramids approximately ½-inch square at the base and 1-inch high. The adoption of the wording of the specification of the American Society for Testing Materials covering the number of tests required and the placing of test bars on casting is recommended, to be supplemented with a clause covering annealing test lugs about as follows: "Annealing test lugs approximately ½-inch section shall be attached to castings when specified in advance which may be removed by the inspector to ascertain whether or not the annealing has been done properly."

The establishment of a central inspection bureau by the government for steel castings would necessitate the adoption of a single set of specifications for all government work. Insofar as possible, the adoption of the specifications of the American Society for Testing Materials for steel castings is recommended. It is recommended that the inspection of government castings should conform to the inspection of castings for commercial work. Government specifications are so drawn and applied that it is impossible to produce steel castings at the same cost or quantity as those subject to commercial specifications and inspection. This is due to the requirements which demand a large amount of handling in the cleaning and finishing departments and applies particularly to the inspection after castings have been shaken-out of the mold and before they have been cleaned. This congests the steel foundries and greatly interferes with the crane service. This preliminary inspection is considered absolutely unnecessary inasmuch as the final acceptance of the castings generally is made in the machine shop.

### Welding Steel Castings

Manufacturers generally have reported that they have experienced considerable trouble in convincing inspectors that steel castings could be welded without impairing the strength of the product. In its report the committee states that an inspector of steel castings should have sufficient practical knowledge of the use of castings so that he can decide whether defects that are bound to occur are serious or not, and the request is made that the use of welding should be permitted more generally than is allowed at the present time. A very timely article on this subject by H. Cole Estep, published in the Jan. 3 issue of THE IRON TRADE REVIEW, shows that welding can safely be resorted to and many castings may be used that otherwise would be condemned.

The subject of distorted castings is covered as follows in the committee report: "Many causes enter into the manufacture of steel castings that result in warping or distortion. Sometimes this is due to the design and cannot be avoided. Distortion also is caused by lack of precaution in the foundry, presence or absence of fins,

carelessness or error in preparing the molds and many other causes, some of which can and others which cannot be prevented. Information should be furnished the manufacturer before the castings are produced as to which are the important dimensions, so that every precaution may be taken to prevent undue distortion." It also is suggested that castings acceptable in all other respects should be accepted unless it is shown that they are distorted on account of carelessness on the part of the foundry. Furthermore, the manufacturer should not be held liable for any charges for straightening, welding or otherwise making castings acceptable after they are received by the purchaser unless the manufacturer has been so notified in advance and shall have given the purchaser authority for doing such work at his expense.

# War Board

**Reorganized But Baruch Has No Additional Authority**

Washington, April 9.—The announcement yesterday by the war industries board of the plan on which it will be rebuilt does not alter the position in which the board was placed by the President in his letter of March 4 naming Bernard M. Baruch to the chairmanship. Nor does it give Mr. Baruch any more authority. The President's letter centralized in the new chairman the responsibilities formerly borne by the board, and the board's statement simply shows the lines along which Mr. Baruch's administrative machinery will operate. The Overman bill is needed to give the chairman the necessary powers.

The price-fixing committee of the board, named a few days before the conference which preceded the decision on the steel prices which became effective April 1, will not be changed by the reorganization. It is to benefit, however, by the assistance of what the board now calls "commodity sections", which are to be created through the grouping of representatives of the various government departments according to the particular commodities on which control is being exercised. This means J. Leonard Replogle, director of the steel supply section, is to have a special committee made up of representatives from each of the departments requiring steel.

Above all these commodity sections and immediately under Chairman Baruch will be a requirements division. This is to be headed by Alexander H. Legge and will include Mr. Replogle, representing the steel section; Judge E. B. Parker, the priorities section; George N. Peek, finished products, under whom will be machinery and machine tools; Col. George H. Estes, the army; Rear Admiral J. C. Peoples, the navy; F. A. Browne, the shipping board; T. C. Powell, the railroad administration; P. B. Noyes, the fuel administration; C. W. Merrill, the food administration; James A. Carr, the allies purchasing commission; W. S. Gifford, director of the council of national defense; and a representative of the Red Cross yet to be selected.

The requirements division is to pass upon the needs of the various government departments and delegate the particular commodity section interested to go fully and in detail into the question. The section is to handle the matter entirely, subjecting itself to the decision of the director in charge. When dissatisfaction with his determinations arises, appeal may be made to the requirements division, from there to the war industries board itself and finally to the chairman, Mr. Baruch, who will go to the cabinet officers or bureau chiefs under whom the questions arise, to have the problems finally solved. This procedure is regarded as the frankest admission that the war board and its chief still are without authority to determine matters finally.

# Ingot Output

**Shows Big Gain in March—Record Best Since November**

Steel ingot production in March followed the upward swing shown in pig iron output. In both cases production was heavier than in any month since November of last year.

The monthly statement compiled by the American Iron and Steel institute showing the production of steel ingots by 29 companies which in 1916 made 88.14 per cent of the country's total, shows clearly this increase. These companies in March produced 3,110,381 gross tons against 2,273,741 gross tons in February. The average daily output was 100,335 and 81,205 gross tons, respectively.

The record of steel ingot production by these companies since June, 1917, follows:

| Months | Open-hearth Gross tons | Bessemer Gross tons | All other Gross tons | Total Gross tons |
|---|---|---|---|---|
| June, '17 | 2,265,772 | 809,552 | 8,605 | 3,083,929 |
| July | 2,152,479 | 777,171 | 9,465 | 2,939,115 |
| August | 2,251,013 | 863,873 | 8,331 | 3,123,217 |
| September | 2,195,556 | 770,064 | 6,639 | 2,972,259 |
| October | 2,475,754 | 870,494 | 5,687 | 3,351,935 |
| November | 2,384,218 | 772,489 | 9,550 | 3,166,257 |
| December | 2,195,832 | 524,084 | 13,806 | 2,733,722 |
| Jan., 1918 | 1,763,356 | 429,588 | 10,901 | 2,203,845 |
| February | 1,805,233 | 454,457 | 14,051 | 2,273,741 |
| March | 2,331,048 | 763,255 | 16,078 | 3,110,381 |

# Taft to Speak

**At Annual Banquet of National Metal Trades Association**

Former-President William H. Taft will be the speaker at the banquet in connection with the annual convention of the National Metal Trades association at New York, April 23 and 24 at the Hotel Astor. There will be no other speaker at the banquet.

The Wednesday morning session will be devoted to the usual preliminaries, including reports of officers, of standing committees, etc., and will be followed by a buffet luncheon. The remainder of the convention program is as follows:

**Wednesday Afternoon, April 23.**

Industrial Reaction, Judge Edward K. Nicholson.

National Industrial Conference Board, Robert Greene Duncan.

The Employment of Women in an Industry, W. A. Viall. Discussion.

Industrial Training for the War Emergency, H. E. Miles.

**Thursday Morning, April 24.**

New Lamps for Old, James A. Emery.

Present Socialistic Developments, William H. Barr.

Reports of convention committee.

Reports of convention committees.

Election and installation of officers.

# Seek Data on Reduction of Alloy Standards

In order to determine whether a reduction in the number of units in standard ferromanganese and spiegeleisen will be acceptable a questionnaire has been sent to consumer by the subcommittee on ferroalloys of the American Iron and Steel institute. The questionnaire calls for information regarding the percentage of steel which is recarburized with ferromanganese and spiegeleisen; the production of steel containing more than 0.40 per cent carbon and what percentage of this tonnage is recarburized with spiegeleisen; the extent to which 60 to 70 per cent ferromanganese can be used in recarburizing steels below 0.40 per cent in carbon and the length of time which would be required in equipping plants, which have not already been thus equipped, with cupolas.

The questionnaire is accompanied by a letter, signed by James A. Farrell, chairman of the subcommittee on ferroalloys. In part, this says:

The war industries board and the shipping board have called the attention of the ferroalloys committee to the critical situation existing in ocean tonnage and the necessity of immediately further reducing the imports of manganese ores.

# War Problems

**Being Considered by Chamber of Commerce—Alien Newspapers Assailed**

Chicago, April 10. (Special.)—Plunging immediately into effort to eliminate every possibility of secret aid to nations enemies through medium of foreign language newspapers national counsellors of United States Chamber of Commerce in session here yesterday tabled by close vote the proposal that such newspapers be suppressed. The meeting was preliminary to the sixth annual convention of the chamber. President Seiberling of Goodyear Rubber headed off precipitate action by declaring the most important thing is to Americanize alien through agency of foreign language press. President Lucius Teter of Chicago Association of Commerce this morning opened formally the convention by an address of welcome responded to by President R. Goodwin Rhett. The first business session will be held this afternoon when the war service committees will hear important address on shipping by Chairman E. N. Hurley of the shipping board, on the finance by Charles S. Hamlin of the federal reserve board, co-ordination of business and government in wartime by George N. Peek and other speakers.

That American business men collectively and individually should speed forward ship construction is the keynote of an address delivered by Edward A. Filene, chairman of the war shipping committee.

In emphasizing the responsibility that rests upon all, Mr. Filene said: "There are enough men to talk about the blame for delay due to causes which the government can correct. Let us emphasize the blame that rests upon communities and their business men and try to find a way to help. The problem of a contented and effective working force in shipyards will not be solved by talks during lunch hour, but by the definite solution of the discouraging problems of bad housing, inadequate transportation, etc. What can the business man of the United States do in these fields? He can see that business organizations, wherever ships or ship parts are being turned out, shall be organized into an effective shipbuilding aid, and he can help organize the community behind the shipbuilding."

## Makes Big Subscription

New York, April 9.—Chairman Gary in a statement issued today states the Steel corporation will subscribe for $25,000,000 of new Liberty loan bonds and it will subscribe for $10,000,000 additional to be offered employes of corporation and subsidiary companies on an installment plan. Judge Gary stated corporation's blast furnace operations now are at the rate of 89 per cent, ingot capacity at 93 per cent and finishing mills at about 85 per cent.

## Will Build Magnets

The Ohio Electric & Controller Co., 5900 Maurice avenue, Cleveland, has been incorporated with a capital stock of $200,000, for the purpose of manufacturing lifting magnets and electrical controlling devices. Lifting magnets will be built at once and a complete line of controlling devices added later. The officers of the new company include F. W. Jessop, president; W. B. Greene, vice president; and A. D. Walter, secretary and treasurer. Mr. Jessop was formerly works manager of the Electric Controller & Mfg. Co., Cleveland. He has had an extensive experience in the manufacture of lifting magnets and electrical apparatus for the control of light and heavy machinery.

# Less Favorable

**Are Operating Conditions in Pittsburgh District—Pig Iron Short**

Youngstown, O., April 10.—Operating conditions in this and the Greater Pittsburgh districts are not as favorable this week as they were the week before. Reports for the week ending April 6 show that by-product coke ovens were operating at 93 per cent, the same as the week previous; open hearths at 87 per cent, a decrease of 11 per cent over the previous week; bessemer plants at 79 per cent, a drop of 4 per cent over the week before; and blast furnaces at 88 per cent, as compared with 92 per cent.

Scarcity of pig iron is slowing down the steel production somewhat in this district. One iron and steel company is in the market for large tonnages of basic and bessemer but is unable to buy. Another company which operates a 300-ton furnace in a nearby city has 2500 tons of bessemer in stock but is unable to load it on account of a scarcity of labor.

# The Non-Ferrous Metals

**Copper Lead Spelter Tin**

New York, April 9.—The shortage of tin continues acute. No spot metal is offering, while it is extremely difficult to buy futures of any grade excepting Chinese. Local importers received cables from their correspondents in Batavia last week requesting them for an extension of credits, originally provided for 30 days, which is clear indication that the Dutch vessels which had been scheduled for sailing in March were detained pending the outcome of negotiations between the allies and Holland over the seizure of the Dutch ships. Imports of tin from the Dutch East Indies have been figuring more and more in American consumption the past several years, the imports since 1913 having been as follows: 1914, 260 gross tons; 1915, 3253 tons, 1916, 7575 tons and 1917, 9273 tons. In January this year Dutch tin imports were over 1700 tons, against a little over 1200 tons a year earlier. Undoubtedly, in view of the declining output of Straits tin, gether with the increased consumption of this country due to tin plate requirements of our mobilized forces, the Washington authorities had been counting on considerable assistance from the Dutch East Indies. The tin trade is wondering how far these calculations are to be upset by the present holding up of shipments. Arrivals of all kinds of tin at Pacific ports in March were 3451 tons, and at Atlantic ports, about 1700 tons, making total in excess of 5100 tons, which is above the average consumption of about 5000 tons monthly. However, the prospects for arrivals during coming months apparently are not so good.

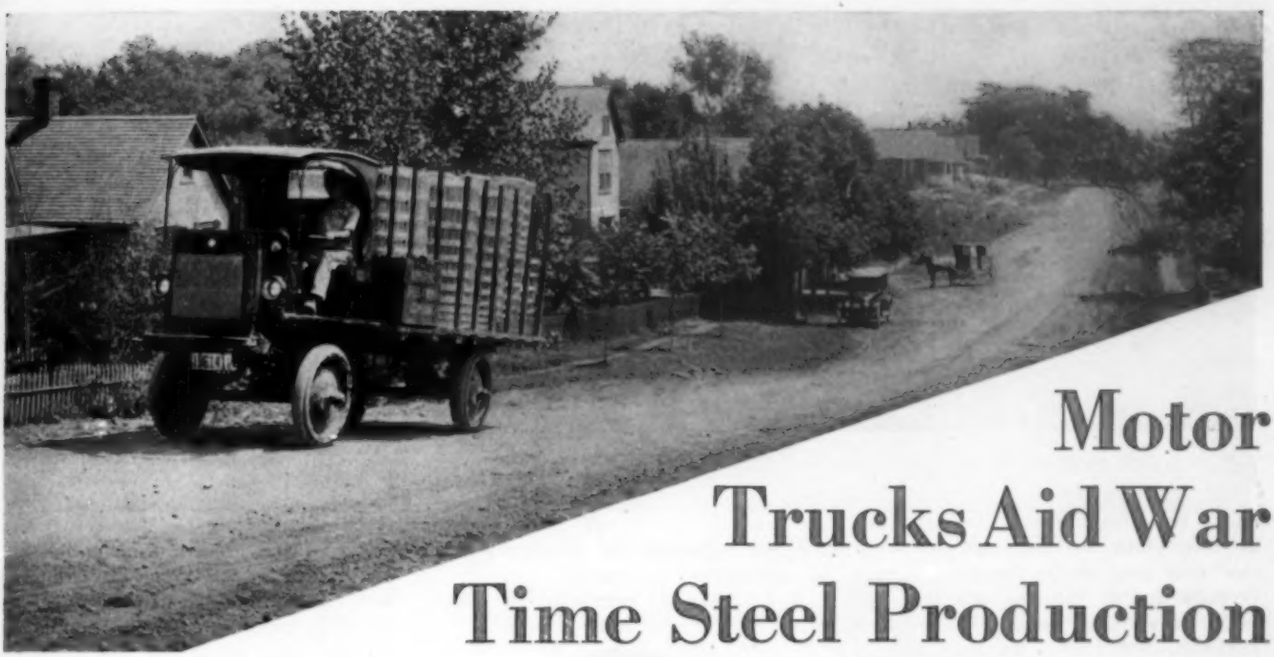
The spelter market weakened still further last week. Producers offered prime western at 6.87½c, St. Louis, for April and May shipment without arousing buying interest for more than a few cars. Consumers are not inclined to tie their money up in spelter stocks even at bargain prices. The market for prompt, April and May shipment may be quoted 6.87½c to 7c, St. Louis. The government fixed prices of 12c on Grade A, 14c on zinc plates and 15c on sheet zinc are unchanged.

The government obtained its lead requirements in March at 7.09c, St. Louis, this being the average quotation for the month as published in the *Engineering and Mining Journal*, which is accepted as the basis. The outside lead market has been gradually easing off until now it stands about ¼c a pound below the leading interest's quotation of 7.25c, New York, for prompt, April and May shipment from the West. Some spot spelter has been offered in New York at 7.25c.

The market for copper is unchanged and featureless, producers continuing to devote most of their efforts to filling government orders at 23.50c the fixed price for carloads. Less than carload lots are obtainable at 24.67½c.

No activity has been reported in antimony the past week. The price ranges nominally from 12.67½c to 12.87½c, duty paid, New York.

The aluminum trade has become almost entirely adjusted to the new fixed price of 32c for 98 to 99 per cent ingots. Remelters are protesting against the price of scrap, which they say is quoted too high to make smelting profitable at the fixed price. The aluminum output is being taken largely by the government.



# Motor Trucks Aid War Time Steel Production

BY D. M. AVEY

THE public is sated with sensation. Events of momentous importance pass almost unnoticed by a generation which has witnessed the greatest of advances in science and the remaking of the world's geography. During the past winter the first train of 30 massive trucks lumbered through an eastern city driven and guarded by soldiers who sat half concealed under the overhanging khaki coverings. A traffic officer at the busiest downtown corner checked the stream of vehicles and street cars long enough to allow the transport train to pass, and a few who felt that they could spare the time stopped for a moment out of curiosity and then hurried on. These were just a few of the new standardized army trucks being delivered across country for shipment to France, but they represented as radical a step in the advance of transportation as the first barrel-stack wood-burning locomotive that wheezed across the prairies.

Motor transportation in every field owes much to the war, for demonstrating broader fields of usefulness. France might have been overwhelmed had railroads been the only means for handling her troops and supplies. Motor trucks defeated the invaders at the battle of the Marne, and since that time all of the armies have been heavily dependent upon every sort of motor transport. In civilian life the dependence upon automobile carriers has been even more marked. The extra burdens of transportation coupled with the shortage of labor have thrown a responsibility upon the motor truck which it has met with splendid success.

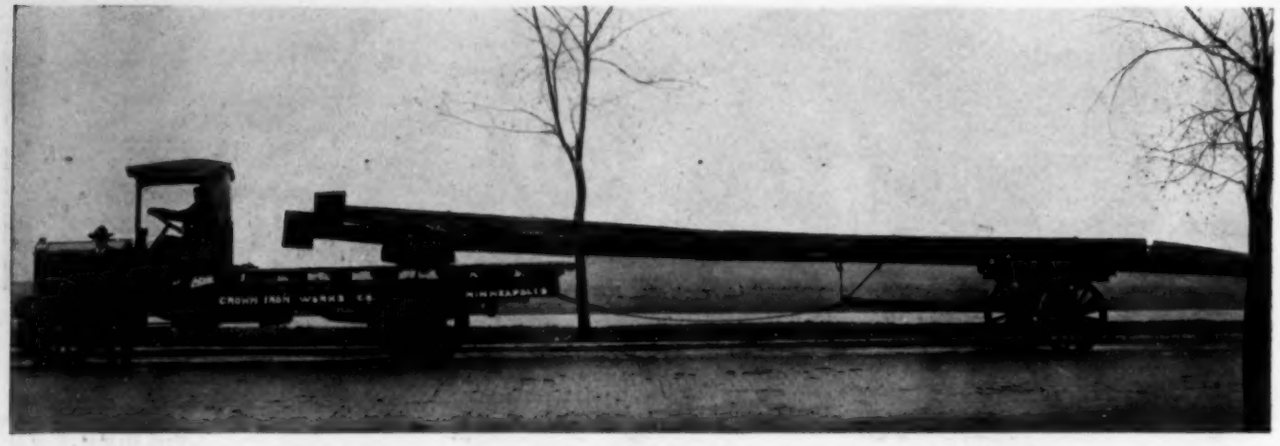
There are three great uses for motor trucks in the iron and steel industry. They may briefly be described as the intra-plant, inter-plant, and inter-city haul. The first and last classes of service have been developed almost entirely as a result of war demands, while the second has been a gradual development parallel with automobile construction.

### *Scientific Management*

Within modern iron and steel manufacturing plants, as well as in machine shops, foundries, etc., scientific methods have governed details of arrangement. Every factor which tends to increase production has met with encouragement. In fact, the universal demand for maximum production could not have been met without attention to that shop arrangement which entails a minimum of time and labor. During manufacture, materials are carefully routed through the different processes and operations and are handled as quickly and economically as possible. Specially designed cranes, handling machines, manipulators, locomotives, roll tables, traveling belts, storage battery trucks, tractors and motor trucks all do their bit in war time iron and steel production. In handling the heavier materials such as molten metal from the blast furnaces, open hearths, electric furnaces and bessemer converters, locomotives and railway cars perform the carrier service and a complicated system of tracks and switches is necessary. In practically every other branch of intra-plant transportation it is possible and economical to use motor trucks. Even when heavy ladles are handled by locomotives and ladle cars, trucks are sometimes used to spot cars and ingot buggies during intervals between other intra-plant services.

In bar and sheet mills, foundries, forging and fabricating shops, motor trucks perform almost continuous intra-plant service. Some peculiarity of plant arrangement often requires material to be moved and stored and then removed to a point where some additional operation is performed upon it. In other cases plant extension limited through the character of surroundings has required one part of a manufacturing business to be located at some distance from an earlier unit, so that material has to be transported some distance in going from one operation to another. Countless odd jobs of transportation, the moving of material, of repair parts, and smaller machines to remote points within the plant fences are encountered in every large concern. These and countless other exigencies form the daily task of the modern motor truck in intra-plant service. This hauling has been facilitated in several instances by the construction of roadways leading between the buildings and through the mills and shops in order that trucks may be operated with a minimum of tractive resistance. In one or two instances, permanent roadways of brick or concrete have been constructed.

From plant to warehouse or freight house, and from warehouse or freight



MERE LENGTH IS NO HANDICAP IN HANDLING STRUCTURAL SHAPES FROM THE FABRICATING SHOP

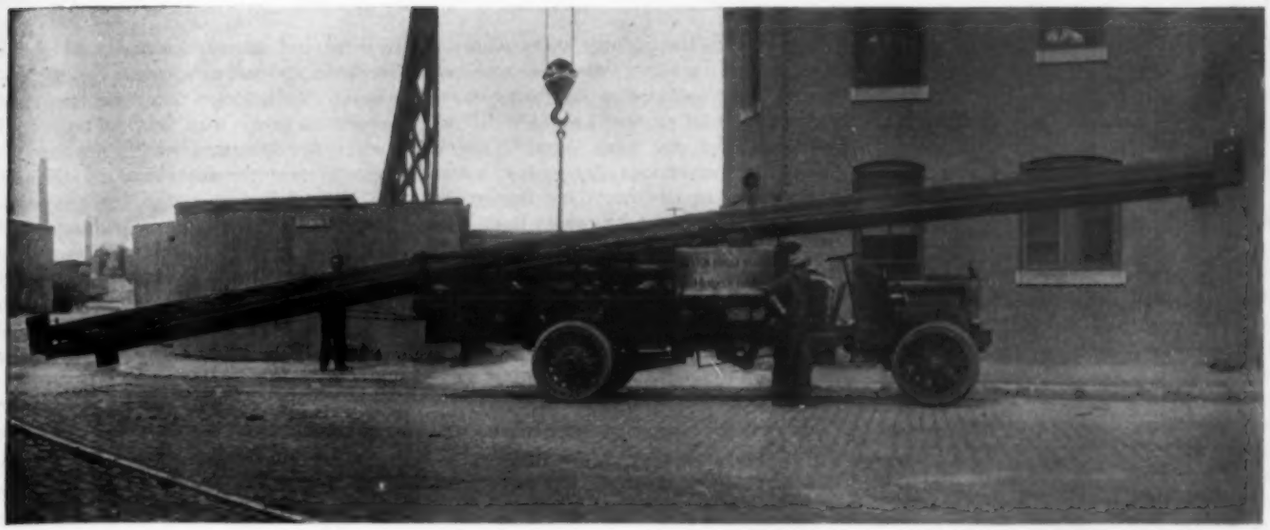
house to consumer may be classified as inter-plant service, and it is in this field that motor trucks are universally active. During the last five years teams and wagons have been supplemented almost entirely in this field, due to the economy and greater range of activity of motor transportation. All kinds of structural material, bars, plates and sheets as well as finished shapes, parts and machines are transferred over territories within a radius of 50 miles or more by automobile trucks. In almost every case cranes are employed in loading at the plant or warehouse, and a knowledge of delivery conditions forms the basis for the method of loading.

For example, if cranes are to be used to unload bars which are sent out from the warehouse, blocks are placed under the goods to raise them from the bed of the truck so that chains can be slipped under the bars for unloading. The strength of bridges, the character of the roads or streets to be encountered over the route govern to a large measure the loading of trucks and the laying out of delivery schedules. Special devices are used in many cases to provide for the handling of extremely long or odd-shaped pieces.

The greatest handicap to motor truck use outside the plant or warehouse at the present time is the lack of unloading facilities. In handling material to the freight house for example, efficient detail is not lacking at any point along the line until the railroad platform is reached. The goods are handled quickly and efficiently at the plant, where a skillfully operated crane, often one that may be moved about the plant or warehouse, loads the truck. Care as to routing, and an avoidance of overloading minimizes the delay in delivering the goods to the freight house. But at this point the truck is often compelled to wait its turn with many others, and upon finally reaching the delivery platform must discharge the load by hand or by other inefficient means unless it is itself equipped with a crane. These obstacles are not encountered so frequently in the case of delivery from warehouse to customer, as trucks are seldom delayed in unloading. In a number of iron and steel manufacturing plants experience has shown that a three to five-ton truck will displace at least two teams of draft horses for inter-plant work; the extra range

THE DRIVER IS THE GREATEST SINGLE FACTOR IN MOTOR TRUCK ECONOMY

THE TRUCK, ASSISTED BY THE TRAILER, AIDS THE SHIPBUILDING PROGRAM BY MOVING A 14-TON PILE DRIVER



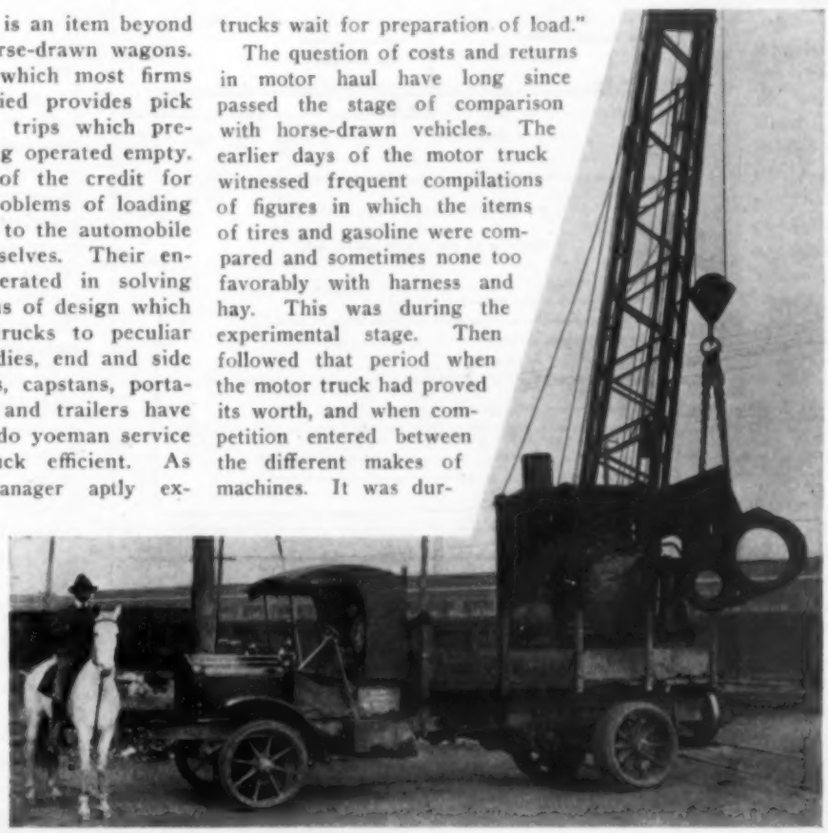
BRIDGES DELIVERED TO ORDER INDEPENDENT OF FREIGHT CONGESTION—A HEAVY AND AWKWARD LOAD

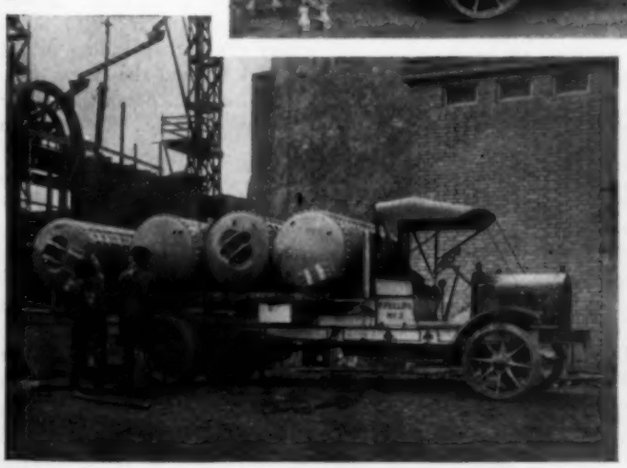
of territory reached is an item beyond comparison with horse-drawn wagons. Intelligent routing which most firms have carefully studied provides pick up work on return trips which prevents the truck being operated empty.

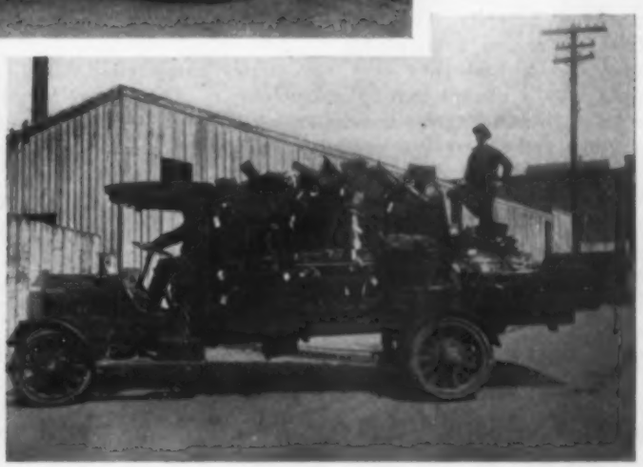
No small share of the credit for meeting the cost problems of loading and handling is due to the automobile manufacturers themselves. Their engineers have co-operated in solving the detailed problems of design which have adapted the trucks to peculiar service. Special bodies, end and side dump beds, winches, capstans, portable loaders, cranes and trailers have been devised which do yoeman service in making the truck efficient. As one steel plant manager aptly expressed it, "There is one big condition upon which economical track operation depends. You must keep them rolling. Your depreciation and labor costs are on the job while your trucks wait for preparation of load."

The question of costs and returns in motor haul have long since passed the stage of comparison with horse-drawn vehicles. The earlier days of the motor truck witnessed frequent compilations of figures in which the items of tires and gasoline were compared and sometimes none too favorably with harness and hay. This was during the experimental stage. Then followed that period when the motor truck had proved its worth, and when competition entered between the different makes of machines. It was during this stage that the iron and steel industries learned of the value of the motor truck to their business. Progressive methods of accounting have always characterized these industries, and a keen insight into cost factors was brought to bear on the problems connected with the motor transportation question.

One manufacturer whose company has developed concurrently with the iron and steel industry was a pioneer in the investigation of the motor truck. His company was induced to buy one of the earliest practical vehicles which







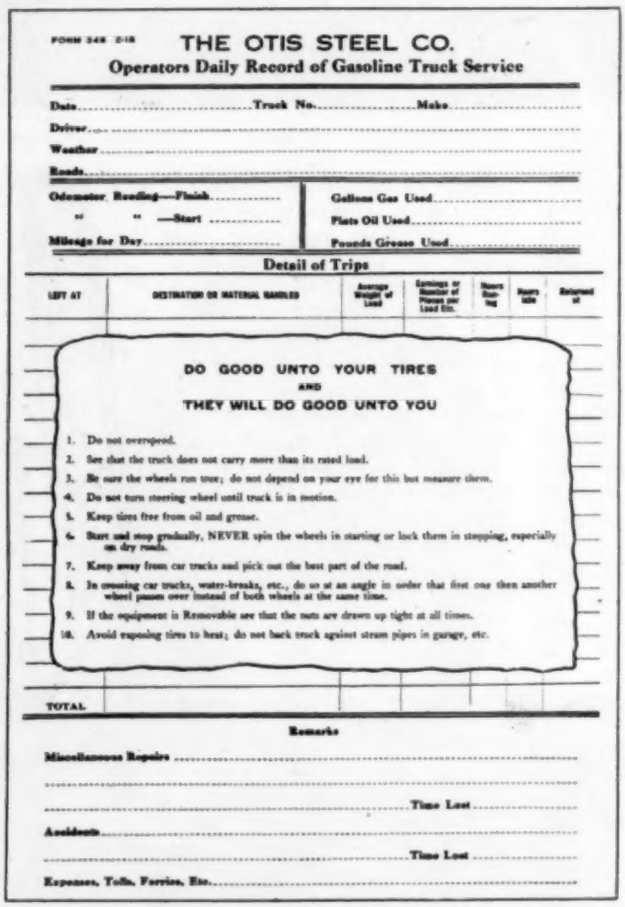
LOCOMOTIVES ARE BUILT WITH THE AID OF MOTOR TRUCKS WITHIN THE PLANT
A COMPLETE BOILER INSTALLATION ON ONE LOAD JUST A LITTLE BIT OF EVERYTHING—RUSHED

was placed in competition with a number of wagons. This truck, though it had many weaknesses of design which have been modified in later machines, demonstrated its economy under cost comparison with teams and wagons, and formed the nucleus for a fleet of nine trucks which this company now employs constantly. The same care in keeping costs is observed at the present time, even though there is no need for a comparison on a competitive basis with other kinds of equipment or with other types of trucks. A close record is kept of each truck, and the data secured when analyzed with a view to the class of haul and the character of the territory with reference to grades, road surfaces, etc., furnishes a basis for measuring the efficiency of the delivery system and the men employed.

There are many factors entering into the question of costs in motor truck hauls in iron and steel lines which require a careful system to bring out. The very character of the material handled in most cases is a challenge to the sturdiness of the motor truck. Steel plates, sheets, bars, forgings and castings have a comparatively small bulk for their weight. It is easy to overload a truck with such material, and an overload means a mounting depreciation, tire and repair expense. The light converted truck has failed under the rigorous trials of this class of work. The manager of a warehouse branch which employs a large number of trucks attribute this failure, however, to other factors in addition to lack of stamina. He says:

"We simply could not get our men to use the light machines properly. Whether this was due to a knowledge of the fact that they cost the company less, I cannot say. We had one small converted truck which we used to take light hurry-up orders around the city, and the drivers soon racked it to pieces. They would overload it constantly and always preferred to skid around corners rather than take them at a reasonable speed. The little truck simply could not stand the gaff. It cost us more in repairs than our largest machine."

Two factors confuse the question of motor truck operatings costs. They are labor and depreciation. Depreciation charges vary from 10 to 30 per cent with different companies as in almost every case the depreciation charges have been arbitrarily fixed and are based upon what the operating company regards as the probable life of the car. In one case, several trucks are in active service every day, which have been in use for over five years, and the entire first cost has been charged off long since. It would afford a less complicated basis for comparison if depreciation could be handled separately from operating expenses, as the other elements of cost are capable of more accurate compilation, and a closer analysis.



FORM 348 2-18

**THE OTIS STEEL CO.**

**Operators Daily Record of Gasoline Truck Service**

Date.....Truck No.....Make.....

Driver.....

Weather.....

Roads.....

Odometer Reading—Finish..... Gallons Gas Used.....

" " —Start..... Pints Oil Used.....

Mileage for Day..... Pounds Grease Used.....

**Detail of Trips**

| LEFT AT | DESTINATION OR MATERIAL HANDLED | Average Weight of Load | Estimate of Number of Pieces per Load Etc. | Hours Run | Hours Idle | Returned at |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

other trucks operating under the same conditions or furnishes a month-to-month check on expenses.

A good driver takes a natural pride in the mechanical perfection of the modern motor car. This spirit is carefully fostered and healthful rivalry between drivers is developed by a judicious use of the cost sheets. Most companies handle their own repair work using mechanics from their own machine shops, and the drivers are encouraged to use their spare time during work hours to attend to minor repairs and to keep their machines cleaned and well oiled. The care of the cars on intra-plant service and on the comparatively short hauls incident to local delivery is easily handled by the operating company's own force. The development of inter-city motor truck freighting, however, will place many of the details of maintenance upon the automobile manufacturers' service stations and the cross roads garage.

### *The Coming of the Motor Freight*

The possibilities of inter-city transportation (freight haul by motor truck), is a direct outgrowth of the war. The army truck trains loaded with extra parts and other equipment. which have rolled across the continent from the middle states to the seaboard, are only a symbol of a transition stage in moving commodities. The real significant feature, and one solely due to the war is the establishment of an increasing number of regular freight routes.

Under the added load of war time necessity, hampered by the coal situation and an unusually severe winter, railroad transportation has fallen down. Even the most essential freight has been delayed and congested at terminals beyond any hope of immediate extrication. As a result, the motor truck has not had to compete on a basis of truck haul costs vs. freight rates, but has rather competed with express rates, for even electrical machinery, pianos, safes and machine tools have been transferred by express during the past winter to avoid the delay of freight service.

### *Motor Truck Service*

Motor truck trains are in regular service out of Boston, New York, Philadelphia, Baltimore, Buffalo, Cleveland, Chicago, Indianapolis, Providence, Akron, O., and Washington, and others will be in commission in the early spring. Some of these lines are operated by transfer companies, who handle their long haul by three to six-ton trucks and then pick up the freight from their landing platforms in the larger centers and deliver it to the consignees by means of lighter trucks. In a number of cases, large manufacturing interests have installed motor truck service to deliver finished products from their factories and to return with raw materials or supplies.

Insofar as the iron and steel industries are concerned, motor truck freighting has proved a friend in need. Trucks have delivered on schedule time materials for the construction of cantonments, shipyard equipment, supplies, foundry parts, and forgings for assembly into warmaking devices. On their return trips they have picked up vital materials and supplies to aid production. Those companies which maintain a warehouse service in the larger centers have found the motor truck an invaluable aid.

One such company has a warehouse situated in New Jersey from which it is necessary to make deliveries into New York City as well as to a number of manufacturing centers within a radius of 50 or 75 miles of the "Jersey side". Previous to the installation of motor truck delivery it required three days to reach customers in New York City from the New Jersey warehouse. It was necessary to ship by rail to a landing opposite New York, thence by lighterage to the other side and finally by truck or rail to the customer. Depending entirely upon the rail facilities for final delivery sometimes as much as two weeks were consumed. Since the company installed its own truck freight line, delivery is made in one day.

This instance suggests possibilities for relieving congestion at the freight terminals. The belt-line system allows freight to be shifted around instead of through cities, but freight terminals are usually located within the city. By using motor trucks to take all local freight which must go into a center, the freight depot could be located outside the congested district, and could also be made a sorting and routing point.

### *Character of the Truck Industry*

The discussion of freight haul by motor trucks suggests the position of the truck manufacturer as a recipient of freight as well as a transportation agent. Hints of embargo upon the materials used in truck construction have raised the question and it has been met by a preponderance of evidence that should leave no doubt as to the essential character of the industry. The motor truck as a finished product asks no quarter from the freight embargo. Every day witnesses a long line of

**Cost Analysis on Five-ton Truck A*.**

| Mth. | Mileage | Miles per day | Tons | Tons per day | Supplies Amount | Supplies Cost per Ton | Supplies Cost per Mile | Repairs Amount | Repairs Cost per Ton | Repairs Cost per Mile | Wages Amount | Wages Cost per Ton | Wages Cost per Mile | Total Operating Expense Amount | Total Operating Expense Cost per Ton | Total Operating Expense Cost per Mile | Miles per gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 287 | 12 | 297 | 13.00 | 31.15 | 0.105 | 0.109 | 9.60 | 0.032 | 0.037 | 86.40 | 0.290 | 0.301 | 127.15 | 0.427 | 0.447 | 2.50 |
| Aug. | 369 | 15 | 318 | 13.30 | 30.37 | 0.095 | 0.082 | 3.25 | 0.010 | 0.009 | 97.20 | 0.304 | 0.263 | 130.82 | 0.409 | 0.354 | 3.00 |
| Sept. | 213 | 11 | 279 | 14.00 | 24.76 | 0.088 | 0.116 | 4.70 | 0.017 | 0.022 | 86.40 | 0.310 | 0.405 | 115.86 | 0.415 | 0.543 | 2.30 |
| Oct. | 274 | 16 | 294 | 14.00 | 26.94 | 0.092 | 0.098 | 1.10 | 0.004 | 0.004 | 84.70 | 0.290 | 0.309 | 112.74 | 0.386 | 0.411 | 2.50 |
| Tot'l | 1143 | .. | 1188 | ..... | 113.22 | ..... | ..... | 18.65 | ..... | ..... | 354.70 | ..... | ..... | 486.57 | ..... | ..... | .... |
| Av. for 4 mos. | 286 | 13 | 297 | 13.60 | 28.31 | 0.096 | 0.099 | 4.41 | 0.016 | 0.016 | 88.68 | 0.299 | 0.310 | 121.64 | 0.411 | 0.425 | 2.60 |

**Cost Analysis on Five-ton Truck B.**

| Mth. | Mileage | Miles per day | Tons | Tons per day | Supplies Amount | Supplies Cost per Ton | Supplies Cost per Mile | Repairs Amount | Repairs Cost per Ton | Repairs Cost per Mile | Wages Amount | Wages Cost per Ton | Wages Cost per Mile | Total Operating Expense Amount | Total Operating Expense Cost per Ton | Total Operating Expense Cost per Mile | Miles per gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 439 | 18 | 208 | 8.31 | 53.63 | 0.258 | 0.122 | ..... | ..... | ..... | 94.20 | 0.453 | 0.214 | 147.83 | 0.711 | 0.336 | 1.95 |
| Aug. | 619 | 23 | 173 | 6.41 | 73.65 | 0.425 | 0.119 | ..... | ..... | ..... | 96.40 | 0.557 | 0.156 | 170.05 | 0.982 | 0.275 | 1.95 |
| Sept. | 488 | 26 | 201 | 10.53 | 78.38 | 0.390 | 0.161 | 2.82 | 0.014 | 0.006 | 90.00 | 0.447 | 0.184 | 171.20 | 0.851 | 0.351 | 1.95 |
| Oct. | 568 | 24 | 247 | 10.30 | 73.56 | 0.298 | 0.130 | 26.48 | 0.107 | 0.046 | 99.75 | 0.404 | 0.175 | 199.79 | 0.809 | 0.351 | 1.97 |
| Nov. | 416 | 21 | 180 | 9.00 | 69.39 | 0.386 | 0.167 | 18.97 | 0.105 | 0.046 | 99.55 | 0.553 | 0.240 | 187.91 | 1.044 | 0.453 | 1.93 |
| Dec. | 244 | 16 | 71 | 4.80 | 77.38 | 1.090 | 0.317 | 174.60 | 2.460 | 0.716 | 98.60 | 1.390 | 0.404 | 350.58 | 1.390 | 1.437 | 1.78 |
| Tot'l | 2774 | .. | 1080 | ..... | 425.99 | ..... | ..... | 222.87 | ..... | ..... | 578.50 | ..... | ..... | 1227.36 | ..... | ..... | .... |
| Av. for 6 mos. | 492 | 21 | 180 | 8.22 | 71.00 | 0.394 | 0.153 | 37.15 | 0.206 | 0.080 | 96.41 | 0.536 | 0.209 | 204.56 | 1.136 | 1.136 | 1.92 |

**Approximate Cost of Operation of a Five-ton Truck in 1911.**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. for 1 yr. | ... | 50 | ... | ..... | 840.00 | ..... | 0.056 | 450.00 | ..... | 0.030 | 1040.00 | ..... | 0.069 | 2330.00 | ..... | 0.153 | .... |

*These costs do not include tires, depreciation, interest or insurance.

drive-aways leaving the motor truck factories, and many times each truck carries another, mounted "pick-a-back", to its destination. Thus it is only through raw materials and coal that a freight embargo could check truck manufacture, and that such an embargo would be an economic error is shown by the fact that a truck repays in actual ton-miles of freight hauled many times its equivalent in a month's service. There are over 300,000 motor trucks in the United States at the present time, and of this number more than 80 per cent are engaged in some activity connected with housing, equipping, arming, or feeding our fighting forces or the industrial army behind them. In the iron and steel industries production is paramount; production demands adequate transportation; and transportation depends ever more vitally upon the motor truck.

SPECIAL TRUCK BED FOR HANDLING PLATES AND SHEETS, AND SIDE BRACKETS FOR BARS AND LONG SECTIONS

## Equipment is Wanted

Atractive opportunities for the marketing of American shop machinery, tools and other equipment, are set forth in a 164-page report by Commercial Agent Frank Rhea, on "Railway Materials, Equipment and Supplies in Australia and New Zealand", issued by the bureau of foreign and domestic commerce, department of commerce. A careful analysis of the workings of the government-owned roads of Australia and New Zealand is given. Copies of the report may be purchased for a nominal sum from the superintendent of documents, Washington.

## Enlarge Scope of Pressed Metal Association

The Pressed Metal association will hold a meeting in Washington, Wednesday afternoon, April 17, when action will be taken to increase its scope by making it a national trade organization. The subject was discussed at a meeting in Washington, March 13, and was brought up by Douglas P. Cook, vice president and manager of the Boston Pressed Metal Co., Worcester, Mass., president of the association, who outlined the need for a pressed metal association of national scope. The purposes, he said, are to facilitate co-operation between the industry and the government during the war, to make possible co-operative study and united action on all problems affecting the industry at large, to exchange ideas on methods of manufacture and cost accounting, and to promote a closer acquaintanceship among the representatives of the industry. The details of perfecting the increased organization, expending the staff of the present war service committee and arranging the apportionment of dues, was left to the executive committee, which met in Cleveland, March 28. In connection with the apportionment of dues each prospective member is requested to report his competitive sales of pressed metal stampings for the first half of 1917 to the secretary's office at Washington. More than 70 pressed metal companies in the United States have expressed themselves as favorable to the plan of developing the association.

## Urges State Furnace

Appointed by Great Britain in 1917 to inquire into and report upon the advisability of establishing state iron and steel works in Queensland, Australia, the royal commission has made a progress report. As a result of the investigation the commission recommends that steps be immediately taken to establish on a site to be chosen by the mines department, a state blast furnace to produce commercial pig iron where the country's iron ore deposits can be tested in bulk. In its report, the commission points out the fact that Queensland has all the essentials for successful manufacture of pig iron and that such a project would be profitable to the state in view of present prices and those which probably will obtain for a considerable time after the war.

## Tin in Virginia

The United States is almost entirely dependent on foreign countries for its supply of tin. As this metal is a war-time necessity, and as a domestic source of supply is urgently needed, all known deposits of tin ore (cassiterite) in the United States have recently been examined by geologists of the United States geological survey. One of the most promising of these deposits is in the Irish Creek district, in the eastern part of Rockbridge county, Virginia, near the summit of the Blue Ridge. This deposit was recently examined by H. G. Ferguson of the survey, which in this research is acting in co-operation with the Virginia geological survey. Mr. Ferguson's report has been published as Bulletin XV-A of the Virginia geological survey, Charlottesville, Va.

The existence of tin ore in the Irish Creek district has been known for many years, and between 1883 and 1893 the deposit there was actively mined. The mining company, however, became involved in litigation as to land titles and abandoned work in 1893. Work on the deposit was never resumed, and the old workings are now caved and heavily overgrown with brush, so that a thorough examination of them is difficult, but what Mr. Ferguson saw in the field and the information he derived from old reports led him to conclude that the deposits along the Blue Ridge in this vicinity offer some promise as a source of tin, both through the systematic working of the known veins and the possible discovery of other deposits.

The cassiterite occurs in quartz veins that cut a granitic rock of peculiar appearance known as a hypersthene granodiorite. The veins do not continue for long distances and their content of tin is probably very irregular from place to place. Some high grade ore was found, however, and some tungsten ore occurs with the cassiterite.

The Birmingham-Trussville Iron Co., Birmingham, Ala., is planning to blow in its Trussville stack during the month of April.

# Modern Electric Furnace Practice

## Methods of Manufacturing Steel in Electric Furnaces Are Discussed—A Large Per Cent of Low-grade Scrap is Used—Importance of the Installation and Care of Linings

BY J. K. HARRISON

THE electric furnace is playing an important part in the steel industry today. Its great usefulness begins with the manufacture of alloy steels, and it is fast becoming a strong competitor of the crucible process. Where a minimum tonnage is desired, it is fair to assume that the electric furnace is practically indispensable in the manufacture of high-grade steels. Any one interested in those factors which contribute to the economical use of this type of furnace, would be doubly interested in a maximum service at a minimum cost. To develop the modern electric furnace and get the most profitable and economical use out of it, the furnacemen must be instructed concerning operating principles so they can take advantage of all that science has put into it.

Competent electric melters are difficult to obtain. The firm which educates its own men, with a view of retaining them in its service indefinitely, is far ahead of the company which operates its works with workmen who drift from one place to another.

### *Importance of Practical Experience*

It is a well known fact that the production of a furnace is often directly proportional to one's knowledge of the working conditions. The important question to decide is the grade of steel which can be manufactured most profitably in a particular locality. The furnace should be housed in a building which affords ample protection against drafts and the weather if a uniform output is to be maintained. The design of the furnace door is also important and care should be taken to have it fit tightly. Any cold air which enters the furnace not only tends to shorten the life of the lining and electrodes, but oxidizes the steel and cools the furnace by taking up the heat from the inside.

Ventilation of the furnace building is necessary for the welfare of the workmen. A man who works in the shop with his lungs and eyes filled with carbide and lime fumes cannot work as efficiently as the man in a comparatively clean atmosphere. The expenditure of a few dollars would give a clean healthy air to breathe. No two men will get the same production from a furnace, even though they work under identically the same conditions. The old saying that "no two heats work alike" is a true one. However, good results are obtained if a premium is paid for maximum production with minimum furnace cost. It is most important to keep complete records which show the life of each furnace roof, lining and bottom. The electric furnace is well suited for the manufacture of all high-carbon and alloy steels. For the manufacture of low-carbon steels, nearly all specifications call for a low-sulphur content; and those that do not can be readily made in the open-hearth furnace. For this reason it would not be practical for the electric furnace when making soft steel to compete with the open hearth.

Sulphur is extremely difficult to remove from a low-carbon bath, for the reason that only a limited amount of coke can be used during the process of making a carbide slag. Steel held under a carbide slag should not be kept excessively hot unless the slag is high in sulphur. The latter has a strong affinity for iron, especially low-carbon iron and it does not readily leave the low-carbon metal to combine with the lime in the weak-carbide slag. It is much easier to make a white or carbide slag on a high-carbon bath than on a low-carbon bath. The sulphur is more readily removed under these conditions. It is not considered practical to make steel as low as 0.08 to 0.25 per cent carbon in an electric furnace where sulphur as low as 0.025 per cent is desired.

The electric furnace process of making steel is a competitor of the crucible process and is fast forging its way to the front. One of the greatest advantages of the electric furnace is that low-grade scrap can be utilized. The open-hearth process requires a ratio of scrap to pig of about 80 per cent, while in the electric furnace 100 per cent can be readily used. An electric furnace operates economically when an average grade of scrap which does not exceed 0.05 per cent sulphur and 0.10 per cent phosphorous is used. When scrap which contains a higher percentage of these elements is used it prolongs the process, lessens the production of metal and increases the cost of refractories and power.

Machine shop turnings which invariably are coated with rust should never be used in the charge because they increase the oxides in the metal and affect the finished product. The pouring temperature, the size of nozzles, and the condition of the molds, all play an important part in the final result. The usual procedure before pouring the molten metal is to bring the steel up to a temperature in excess of that desired for tapping and allow it to stand for 10 minutes in the furnace with the power off. This procedure tends to govern the amount of carbon which combines with the steel from the slag. The melting and refining should be subject to continuous laboratory observations. Molds should have every care and attention, so that the ingots can be easily removed.

With the constant demand for high-grade steel, the electric furnace has come to stay and in a comparatively short time the electric-furnace business will be classed as one of the leading industries. Most essential in the manufacture of electric steel is an adequate and constant supply of electric power at a satisfactory price. Insufficient transformer equipment has a tremendous influence on the economical operation of an electric furnace, and experience has shown that if the capacity of this equipment is insufficient, it not only occasions delays, but increases the power consumption per ton of steel.

### *Care of the Lining*

In a well-constructed furnace the bottom is practically permanent, if given the proper care and attention. The roof and side walls are repaired frequently, it being necessary to practically reline the furnace from the slag line up about every five weeks. In my experience, from 90 to 100 heats is an average run on one roof and lining. This number of heats is only reached by a careful operator, who sees that the roof is kept free from dust and dirt, and at no time allows the temperature of the furnace to go beyond that actually required. The sides of an electric furnace below the slag line should be built so that each brick is set back on a rack and leaves an inch of the surface projecting from each course. This method of construction requires more brick, but strengthens the bottom and prevents the banks from slipping.

The author, J. K. Harrison, is superintendent of electric furnaces for the Anniston Steel Co., Anniston, Ala.

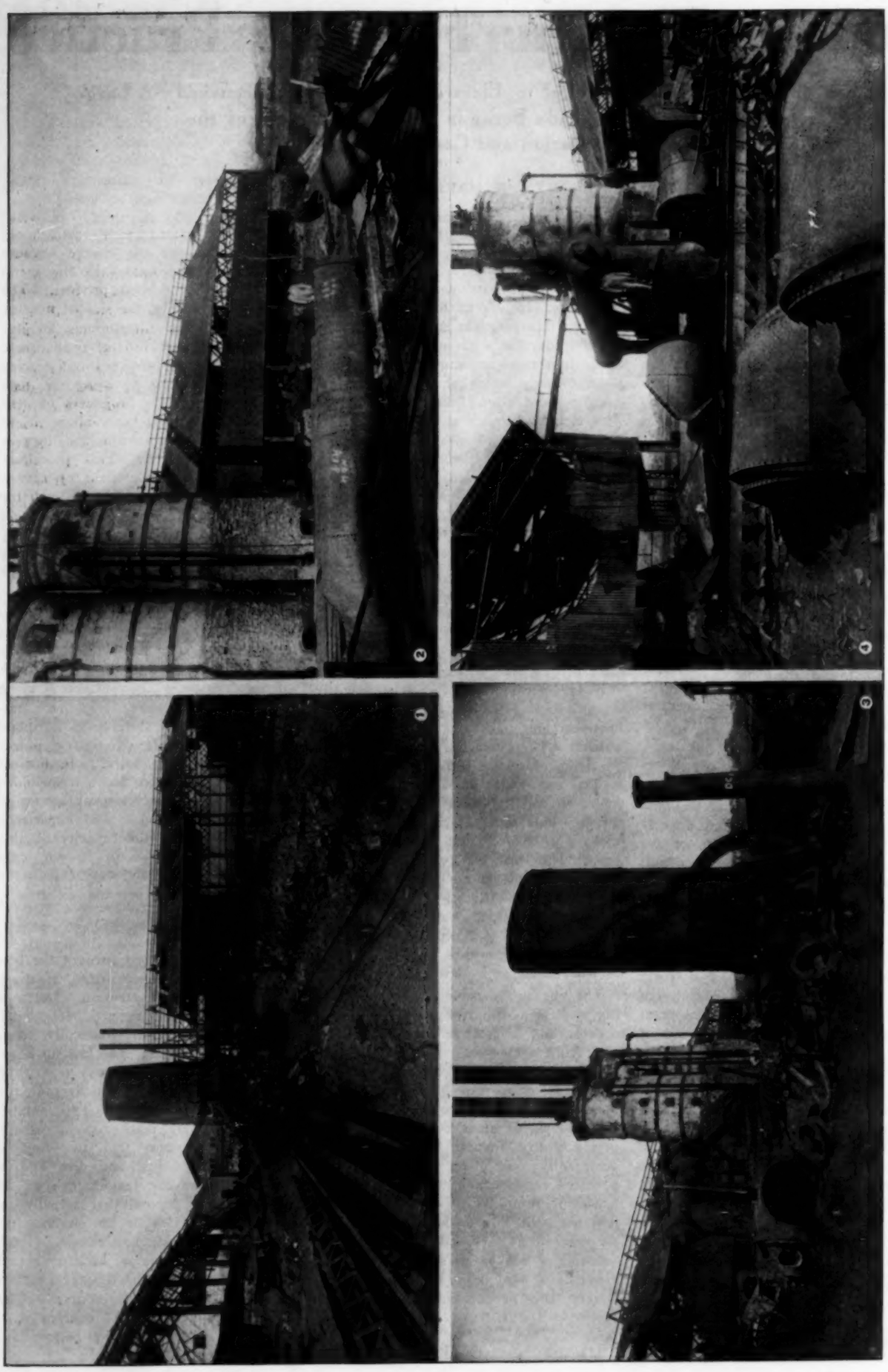


FIG. 1—STACK PARTIALLY CUT DOWN AND BUSTLE PIPE BEING REMOVED IN SECTIONS FIG. 2—VIEW OF OLD WHITWELL BRICKED-IN STOVES. FIG. 3—VARIOUS PARTS OF DISMANTLED PLANT INCLUDING GAS MAINS, FURNACE COLUMNS, FLANGE WORK, ETC. FIG. 4—FURNACE PLATES DISJOINED AND PILED READY FOR SHIPPING

# REMOVING OLD VIRGINIA STACK ACROSS CONTINENT

General View of Bristol Furnace Plant at Beginning of Its Demolishment

SAVING of time as a chief element of profit in getting enlarged iron and steel capacity into commission has been the impelling motive behind some remarkable achievements of new construction and repairs during the past two years of highly stimulated industrial conditions. No more novel development has attended this period of speeded-up production than the dismantling and removal of practically abandoned blast furnaces to new locations many miles distant, where they are to be reassembled and restored to active service. This trafficking in second-hand furnaces has been occasioned primarily by the indefinite delays incident to the delivery of blowing engines and other stack equipment by the builders, as well as by the length of time required for the construction of completely new plants. This factor especially has been of weight where the companies have had available no regular organizations which would be capable of handling expeditiously many of the details of building new capacity under present conditions.

*Old Battelle Furnace First to Go*

In at least three separate cases in this country and Canada, transformation of discarded units into going stacks through their transfer to more advantageous surroundings now is being carried out. Probably the most interesting example has been the purchase and removal of the old Battelle, Ala., furnace by the Tata Iron & Steel Co., of Sakchi, India. This stack now is in the process of transportation thousands of miles overseas to the site of this works. There it is to be re-established as an integral part of the company's furnace group. The Algoma Steel Corp. has been carrying out a similar project in transporting an old furnace from Midland, Ont., to Sault Ste. Marie.

Another interesting operation of a similar character now in a well advanced stage, will redeem for productive use the old Bristol furnace of the Virginia Iron, Coal & Coke Co., at Bristol, Va. Some months ago the plant was purchased by O'Mara Bros., contractors of Philadelphia, who several weeks later sold it to the Pacific Iron Co., of San Francisco, for a large sum, it is reported. Under the direction of O'Mara Bros. the furnace now rapidly is being dismantled preparatory to shipment to the Pacific coast. While exact information as to the new location of the furnace is lacking, it has been reported that it is to be erected somewhere near the southern boundary line of California, and that it will operate on local, Chinese and South American ores. No definite announcement of the new site has been made by anyone responsibly associated with the enterprise. It has been persistently stated that Japanese capital is interested, and this has led to some speculation whether the ultimate location of the furnace may not be in that country.

Unusually severe weather conditions the past month in the south have greatly delayed the work of razing the furnace. The state of demolition can be seen from the accompanying illustrations the photographs for which were taken at a comparatively recent date. It is the plan of the new owners to have the dismantled furnace and equipment ready for shipment in the spring. A large number of cars will be required to convey the plant to the Pacific coast, and the cost of transportation is placed at many thousands of dollars. Each separate part of the dismantled furnace and equipment has been carefully numbered so that their adjustment and setting-up on the new location will be a comparatively simple operation.

The Bristol stack was built in 1890-91, and is 75 x 18 feet. It has a rated daily capacity of about 150 tons. It has been equipped with four Whitwell stoves of the bricked-in type, one of which is 60 x 20 feet, 2-pass, and the other three 60 x 20 feet, 4-pass. The character of the construction of these stoves is shown in the accompanying illustration. The driving units consisted of three steam blowing engines supplied from a battery of 14 water-tube and flue boilers. The furnace was built to smelt local and nearby ores. For a number of years it was operated to furnish metal for the Crescent Rolling Mills at Bristol, which consisted of a puddling plant and rolling mill and was a producer of merchant iron.

*History of Furnace*

When the Virginia Iron, Coal & Coke Co. was formed in 1899, the furnace and rolling mill plant were absorbed along with a number of other furnaces, ore and coal properties in southeast Virginia, eastern Tennessee and eastern Kentucky. The Bristol stack was operated actively during the next several years. When the business depression came on in 1907, both the furnace and mill were closed and they were not operated after that date. A large quantity of iron estimated at probably 50,000 tons was on the banks when the plant went into idleness, and this remained until it was absorbed by the active iron market of the past two years. The Crescent mills were sold and junked some months ago. For a time it was thought the furnace would be rejuvenated and operated by the Virginia company in view of the heavy general demand for pig iron. This plan subsequently was abandoned and the property was offered for sale. Some efforts were made by local capitalists to organize a new company to take over the furnace and operate it on ores from nearby deposits. These were not productive of results and the plant finally was sold as junk to John O'Mara.

# Canadian Mines and Ore Deposits

## Only 15.5 Per Cent of Ore Smelted in Canada in 1916 Produced in Canadian Mines—Descriptions of Three Foremost Ore Producers —Estimated Ore Reserves

DISCOVERY of iron ore in Canada is recorded as early as 1667 and the first forge was placed in operation in 1733. This solitary forge was succeeded in 1737 by a group of forges at Three Rivers, Quebec. The latter remained in almost continuous operation until 1882, being at that time the oldest active iron producer in America. A number of other small plants were erected at various points in Canada during the latter part of the eighteenth and the early part of the nineteenth centuries, but the iron industry did not assume any large proportions until 1896. Since then its growth has been rapid.

In the early days sufficient ore was mined to supply all the demands of the furnaces. Since 1896, however, this condition of affairs has been greatly altered: both the production of iron ore and its consumption in blast furnaces have increased, but the latter so much more rapidly that in 1916 the total production of iron ore in Canada was only equal to 15.5 per cent of the ore smelted in Canadian blast furnaces. The accompanying table shows more clearly than any attempt at description how these extraordinary figures have been realized.

### *Import Ore From the U. S.*

Practically all imported ore comes either from Wabana, in the dominion of Newfoundland, or from the Lake Superior iron ranges in the United States. Wabana, however, is a British colony and upon it is based the Nova Scotia iron and steel industry so the word "imported" has not the same significance when applied to it as to mines in the United States.

At present, all the Canadian ore produced is the output of two mines, the Helen and the Magpie. Both are situated in the Michipicoten district, in Ontario, and both are owned and operated by the Algoma Steel Corp., Sault Ste. Marie, Ontario.

The Helen mine is approximately 1¼ miles wide by ¾ mile long. It is situated on mining claims 68 and 69 in the southern part of the Algoma mining district, and is only 11 miles distant by rail from Michipicoten harbor on Lake Superior. Here is located the ore dock of the Algoma Central & Hudson Bay railway, at which lake vessels of 21-foot draft can tie up.

This mine has to its credit the largest iron ore production of any mine in Canada, the shipments of ore from the commencement of mining operations in 1900 to the end of 1915 aggregating 2,263,522 gross tons excluding 37,572 gross tons of iron pyrites. The ore body has been almost completely worked over and the comparatively small tonnage extracted in recent years has come principally from caved ore, and from pillars left when the ore was extracted by stoping. Average analyses of 1914 shipments are as follows:

| | Per cent |
|---|---|
| Iron | 56.790 |
| Silica | 6.160 |
| Sulphur | 0.264 |
| Phosphorus | 0.095 |
| Alumina | 0.900 |
| Lime | 0.240 |
| Magnesia | 0.152 |
| Manganese | 0.170 |
| Moisture | 4.000 |

The main orebody lay at the eastern extremity of a small lake called Boyer lake, which has been pumped out. In plan the deposit was roughly elliptical with a longer axis of 700 feet on the upper level. The orebody had a pitch of about 60 degrees to the northeast and the vertical extent was about 700 feet. The mine was developed from two shafts, respectively, 435 and 821 feet deep.

An interesting though unfortunate feature of this deposit was the presence in it of pockets of pyritic sand varying in size from those containing a few cubic feet to others varying from 30 to 40 feet in their greater dimensions.

The claims comprising the Magpie mine were staked in 1909 on several showings of magnetite. Exploration by trenching, stripping and test-pitting, and by diamond drilling showed the deposits to consist essentially of siderite, portions of which had been altered to magnetite.

In 1910 a four-compartment shaft was commenced, and in 1911 the erection was undertaken of a roasting plant for the production of a marketable ore from the siderite, which had been shown to have an iron content of about 35 per cent and an objectionable amount of sulphur. The roasting plant was placed in operation in December, 1912, and was operated until October, 1913, when it was dismantled and replaced by a plant better suited to existing conditions.

### *Analysis of Ore*

The average analysis of the 1916 shipments of roasted ore from the Magpie mine is as follows:

| | Per cent |
|---|---|
| Iron | 50.100 |
| Silica | 9.140 |
| Sulphur | 0.136 |
| Phosphorus | 0.013 |
| Alumina | 1.280 |
| Lime | 7.960 |
| Magnesia | 8.040 |
| Manganese | 2.740 |
| Loss by ignition | none |

The roasting kilns are six in number, each 8 feet in diameter and 125 feet long. At the upper end of each is a concrete dust catcher through which the waste gases pass on their way to the concrete stacks of which there are six, one for each kiln. Pulverized coal is used to fire the kilns, machinery used for its preparation being located adjacent to the roasting plant. Rotary cylindrical coolers convey the hot ore to the stock yard, where it is distributed by an electric trolley bridge equipped with a grab bucket. Air compressors, a motor-generator set, machine shop

*(Concluded on Page 922)*

### Mines Report Now Completed

*REFERENCES to Canadian iron ore deposits appear frequently in mining and scientific literature and many excellent descriptions of individual deposits and districts have been published from time to time. With the exception of two or three short papers, however, no attempt has been made to bring together all this scattered and fragmentary information and put it in a form both compact and accessible for reference.*

*Realizing the value and usefulness of such a work, the mines branch of the Canadian department of mines arranged with Einar Lindeman to secure detailed information on Canada's iron ore resources in connection with a general investigation being conducted by this department at that time. The reports of Mr. Lindeman and the reports of a committee of which he was also a member have been compiled by L. L. Bolton and the complete work, in two volumes, is now ready for distribution. The accompanying article is abstracted from Vol. 1 and is devoted chiefly to the descriptions of three mines, Magpie, Helen and Moose mountain.*

# The Hazard of Blast Furnace Work

## A Review of the Causes, Circumstances, and Prevention of Accidents—The Practicability of Safeguards Which Result in a Decreased Number of Injuries and Fatalities is Demonstrated

BY F. H. WILLCOX

IN the past the blast furnace industry was under the stigma of being one of the most prolific sources of killed or seriously injured and permanently disabled workmen of any of the industries of the country. In the popular mind, labor at blast furnaces was little less hazardous than mining, powder making, or railroad work. This impression was based not so much on definite knowledge of the number actually injured and the causes of injury as on the spectacular nature of the accidents that from time to time were described in the press. As with a mine disaster or a railroad wreck so with many furnace accidents, the number fatally injured in such accidents constitutes only a minor proportion of the workmen who suffer more or less serious injuries. However, the reader of the daily paper receives a distinct impression of frightful and sudden disaster which is apt to be associated henceforth in his mind with work at blast furnaces. It is true that in the past this impression has not been without warrant, for from the time of the advent of Mesabi ores, taller furnaces and faster smelting, which began in the early nineties, the newspapers have chronicled a large number of blast furnace disasters.

Blast furnace men have never assumed to tolerate failures in construction or defective control of furnaces. But the admitted hazards of the work are many, and the slow development of improvements in the construction and control of the furnace and its auxiliaries have occasionally given rise to a tendency to accept as a part of the day's work not only the unforeseen and difficultly controlled accidents but accidents whose recurrence might be stopped by the adoption of suitable preventive measures.

In the smelting of iron, even more than in many other industries, safety is inseparably related to efficiency in production, and the accidents strictly incident to work about the furnace are proportional in some degree to the success with which obstacles to smooth working are overcome. This relation does not hold, however, in regard to such accidents as are incident to hand labor, falls, falling and flying objects, machinery and the use of hand tools.

When work is being done on cranes or runways where other cranes are running, the idle crane should be protected by track torpedoes placed 25 to 75 feet away, depending upon the effectiveness of the brakes. An ore bridge equipped with safeguards is shown in Fig. 6.

FIG. 1 — SAFETY ARRANGEMENT FOR ELEVATOR USED IN RELINING BLAST FURNACES. RISING ELEVATOR LIFTS TRAPDOOR COVERING SHAFT. PINS PUSHED THROUGH STRAPS IN ELEVATOR FLOOR PREVENT LOWERING OF ELEVATOR WHILE MEN ARE ON IT

Other suggested safeguards which are widely employed are the use of a sheet iron guard outside the skip track rails; covering the bottom of skip hoists with sheet iron, and the use either of a shield to stop flying rivets or the provision of a warning sign in the path of the flying material. A skip incline adequately protected is shown in Fig. 8.

### *Handling Brick*

For pulling brick from the furnace, men should be given long hoes to enable them to stand away from bricks tumbling and rolling down the face of the pile. When men are loading and wheeling brick away from a pile, the "straw" or "shift" boss in charge at the bottom should have the men keep the brick pulled down to prevent a steep slope on the face of the pile.

The falling of bricks from hoist tubs and down through shafts from the working platform can be prevented by care in loading, or by using a tub with a cover attached to the bail, the cover closing automatically when the hoist is made. The working platform should be provided with trap doors over the bucket shaft, and also over the ladder shaft, to prevent the falling of brick. A safety arrangement for an elevator used in relining blast furnaces is shown in Fig. 1.

Injuries occurring from handling material can be eliminated only by not rushing the work too fast, and by carefulness in taking brick from the chutes and in laying them on the pile or bucket. In laying brick, the usual hazard is injury to the eye from flying pieces caused by chipping or cutting the brick to shape. Many plants now furnish goggles to bricklayers if cutting is necessary. Other injuries are caused by accidental hitting of the hand with the mason's hammer or by having the hand caught between brick in handling them.

Shot firing is almost universally done with a firing machine. Precaution should be taken not to use a greater number of detonators than the rated capacity of the machine. The detonators should be connected in series, and the ends of the lead wires should remain disconnected from the machine and in the hands of a responsible assistant until the foreman has made all connection to the charges in the salamander, has given warning, has stationed guards, and has reached the detonating machine. The lead wires should always be carefully examined each time. It is better to get new wires than to twist broken ends together or to patch defective insulation, for any unnecessary resistance or grounding in the wires makes the chance of misfire more probable. A misfired cartridge or charge in a salamander is probably one of the most dangerous misfires with which one can contend, because the heat in the salamander is apt to set it off after the danger is thought to be past, and while at-

This article is an extract from a bulletin entitled "Occupation Hazards at Blast-Furnace Plants and Accident Prevention," by F. H. Willcox, bureau of mines, Washington, D. C.

**Table I**

## Summary of Data Regarding Location of Accidents

| Location of accident | Total No. of accidents | Cause of accident: Hand labor | Hand tools | Falling or flying material | Falls of person | Burns from hot metal | Cranes, hoists, or rigging | Railroads | Machines or machinery | Burns from cinder | Flames or explosions | Illness (infection) | Electric machinery | Hot flue dust | Asphyxiation | Slips | Miscellaneous |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Car dumper or ore bridge | 40 | 5 | 2 | 5 | 5 | .. | 11 | 7 | 1 | .. | .. | .. | 4 | .. | .. | .. | .. |
| Trestle or ore yard | 124 | 19 | 38 | 21 | 20 | .. | 3 | 9 | 4 | .. | 1 | 5 | 1 | 2 | .. | 1 | .. |
| Stock house | 117 | 30 | 34 | 30 | 6 | .. | .. | 1 | 6 | .. | 2 | 3 | 1 | 2 | .. | 1 | 1 |
| Scale car, skip, or hoist | 37 | 1 | 3 | 4 | 4 | .. | 4 | 15 | 1 | .. | 1 | .. | 3 | .. | .. | .. | 1 |
| Furnace top or stack | 44 | 8 | 7 | 5 | 11 | .. | 3 | .. | .. | .. | 5 | 2 | .. | .. | 2 | .. | 1 |
| Blowpipe, tuyere, bosh, or bustle pipe | 29 | .. | 5 | 6 | 2 | 1 | 2 | .. | .. | 3 | 8 | .. | .. | .. | .. | .. | 2 |
| Tapping hole or cinder notch | 89 | 3 | 13 | .. | 4 | 33 | 4 | .. | 1 | 22 | 2 | .. | 1 | .. | .. | .. | 6 |
| Runner or bed | 78 | 26 | 8 | 5 | 3 | 27 | 2 | .. | .. | 2 | .. | 4 | .. | .. | .. | .. | 1 |
| Elsewhere in cast house | 96 | 32 | 11 | 8 | 7 | 8 | 8 | 2 | 1 | .. | 1 | 6 | 4 | .. | .. | 2 | 6 |
| Pig machine or ladle house | 110 | 12 | 9 | 18 | 8 | 22 | 15 | .. | 7 | 2 | 3 | 3 | 3 | .. | .. | .. | 8 |
| Slag or flue dust disposal | 58 | 7 | 4 | 3 | 7 | .. | 7 | 5 | 5 | 8 | .. | 2 | 2 | 8 | .. | .. | .. |
| Gas-main system | 35 | .. | .. | 9 | 8 | .. | 5 | .. | 1 | .. | 2 | 1 | 1 | 6 | 2 | .. | .. |
| Pig iron or other storage | 69 | 43 | 3 | 10 | 5 | .. | 5 | 2 | .. | .. | .. | .. | 1 | .. | .. | .. | .. |
| Stoves | 39 | 6 | 5 | 8 | 3 | .. | 2 | .. | .. | .. | 4 | 1 | 1 | 4 | 1 | 2 | 2 |
| Boilers | 91 | 11 | 6 | 6 | 14 | .. | 2 | .. | .. | .. | 3 | 3 | 1 | 6 | 11 | 1 | 17 |
| Engine rooms | 76 | 4 | 5 | 7 | 9 | 1 | 6 | .. | 19 | .. | 4 | 1 | 6 | 4 | 4 | 4 | 2 |
| Shops | 43 | 3 | 8 | 7 | 2 | 3 | 2 | .. | 11 | .. | 1 | 2 | 3 | .. | .. | .. | 1 |
| Yards | 91 | 21 | 7 | 7 | 13 | 1 | 6 | 7 | .. | 2 | .. | 6 | 2 | 3 | .. | 8 | 8 |
| Tracks | 68 | 6 | 7 | 5 | 13 | 5 | 8 | 20 | .. | 3 | .. | .. | 1 | .. | .. | .. | .. |
| Pavements or sewers | 21 | 2 | 2 | 4 | 7 | .. | 2 | .. | .. | .. | 1 | 1 | .. | .. | 1 | 1 | .. |
| Misc. | 16 | 6 | .. | .. | 3 | .. | 1 | .. | .. | .. | 3 | .. | 3 | .. | .. | .. | .. |
| Total | 1372 | 245 | 184 | 168 | 154 | 101 | 98 | 68 | 57 | 42 | 41 | 40 | 38 | 31 | 21 | 16 | 59 |

tempt is made to remove it or to set it off again by digging down to it through the stemming, or by drilling a new hole near it. Some plants use the electric light circuit with success to set off charges.

*Protecting the Furnace Columns*

Both on account of the danger to furnace columns, and to life and limb, the hearth should be enclosed as shown in Fig. 5. Men should be stationed at every approach to the cast house, but out of range of flying pieces to prevent any unwary employes from approaching. A curious employe wandered into a central Pennsylvania cast house just as a blast was set off. A flying fragment of salamander took off the seat of his trousers, causing no injury except considerable shock. In the past several fatalities have occurred in blasting salamanders, and it has become the policy of several companies to employ contractors specializing in such blasting, who do the work more quickly and efficiently and also more safely than is possible by members of the furnace force who only infrequently encounter the job.

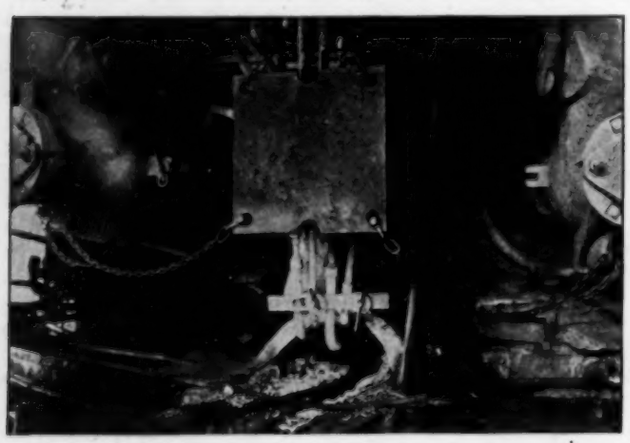
Familiar dangerous practices of working about buckets without lowering or securing the bail, of standing near end doors, of hooking on, and of grasping cables near the sleeve block are repeated. In 1914 two men were killed by the overturning of locomotive cranes at plants where outriggers and rail clamps were provided but not used. Some cranes are provided with electric indicators to warn cranemen when the crane tips to such an angle that further loading will result in overturning. Injuries caused by men being caught between buckets, magnets, etc., and side obstructions while attempting to steady hoisting units before they are let down can be avoided by providing hooks by which the men, working from a safe distance, can steady or stop the swing of equipment.

Stepping on rails in crossing tracks was responsible for five other minor injuries; tripping on rails caused one other injury. Coke along the tracks, insecure ladders, and working without scaffolding are causes that may be eliminated in great part.

*Loading Pig Iron and Scrap*

When pig iron is loaded, all stray pigs should be removed from the end frames and sides. Ladle-house and cast-house men should remove all large accumulations of scrap from the noses of ladles, and avoid overloading cinder ladles with loose cinder-runner skulls, and should not throw them in so that ends project over the sides. Men should be warned to keep away from cars being loaded or coupled or in transit about the yards.

The danger of handling flue dust and the precautions to be observed have been previously mentioned. Ladles of cinder and metal should not be filled higher than 9 inches from



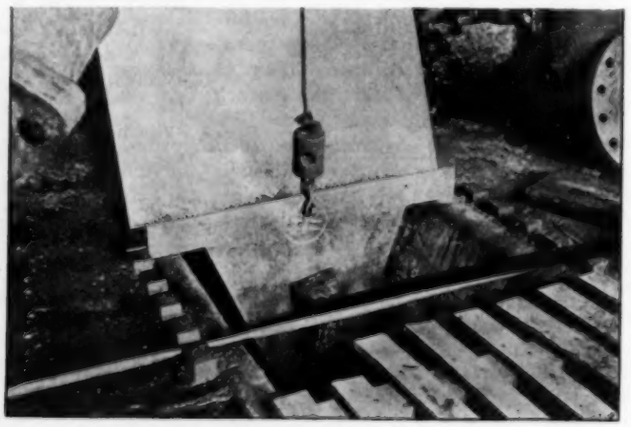
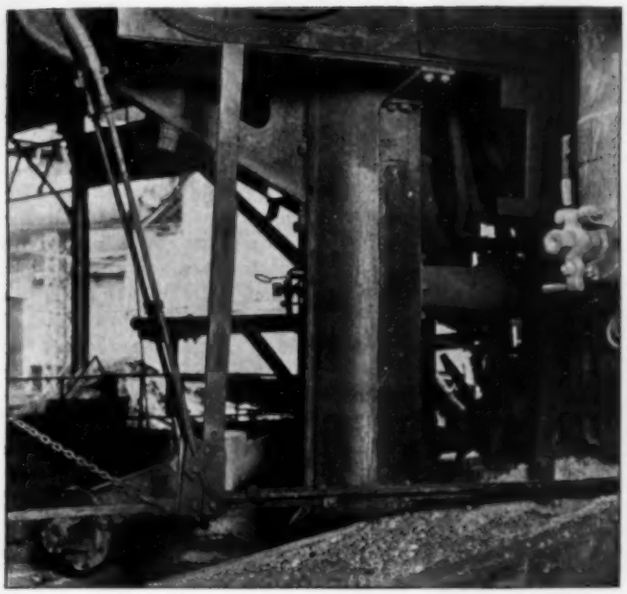


FIG. 2—CINDER SHIELD IN ELEVATED POSITION. SHIELD IS KEPT UP WHEN CINDER IS RUNNING TO PREVENT ITS DESTRUCTION. FIG. 3—SHIELD FOR PROTECTION IN DRILLING TAPPING HOLE. ILLUSTRATION SHOWS THE SHIELD IN POSITION WITH A DRILL INSERTED



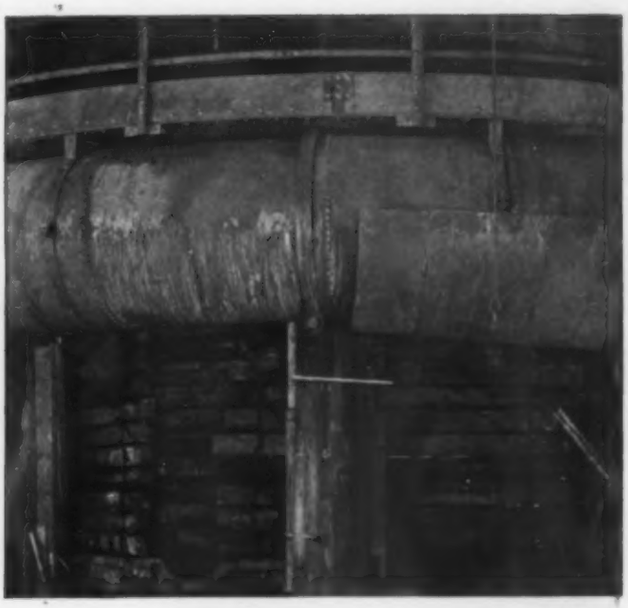


FIG. 4—AUTOMATIC WATER-COOLED BOTTING MACHINE IN POSITION. OPERATOR NOT IN DANGER ZONE. FIG. 5 HANGING BULKHEADS MADE OF RAILROAD TIES, COMPLETELY INCLOSING HEARTH JACKET DURING BLASTING OF SALAMANDER; WOODEN PROTECTION ON FURNACE COLUMNS

the top, and yardmen should be instructed to keep away from ladles in transit. Brakemen can lessen the hazards of splashes by adjusting couplings of ladles and engines or cars before the coupling is made. The practice of standing close to the sills or frames of road cars to observe whether automatic couplers engage is unsafe when loaded cinder or iron ladles are being coupled. When such ladles are being spotted at scales, at mixers, or pig-casting machines it is usually necessary for the brakeman to stand holding the coupling lever while the ladles are uncoupled; consequently the engineer should use special care not to pull away or to stop abruptly.

Leaks in the cinder ladles are nearly always due to cracks, or to iron settling in the bottom and eating through the iron or steel thimble. In attempting to chill leaky cinder ladles with a hose, the workman should remember that iron may be present, and should keep at a safe distance. When it is necessary to venture over cinder in the yard, it is safest to test the surface with a bar or to throw a plank or piece of corrugated iron on the crust to avaid breaking through.

Cracking is the most prolific cause of leaks and of stickers in cast iron thimbles. Cast steel thimbles are stated to be relatively immune from cracks.

Opening the cinder notch is perhaps the least hazardous of work about the front. Small splashes of slag are frequently thrown out but rarely come in contact with the person. At one plant a large shield, shown in Fig. 2, is employed. It is carried by two arms pivoted on an adjacent furnace column. The shield is used when the notch is opened or closed, the tapping bar or picking rod being placed in the cinder notch through a hole in the shield. Small shields, from 15 inches square up, are also used when the cinder notch is opened to prevent small splashes of cinder reaching the man working alongside the fall or runner.

Accidents at the cinder notch due to splashing cinder can be avoided by the use of an automatic bot of the type shown in Fig. 4. Such a bot has been tried for two years at an increasingly large number of plants and has proved satisfactory even with excessively heavy limy slags, and with no danger of explosions when it strikes molten iron coming over the monkey.

At various plants cleats or ribbed plates alongside the cinder fall are provided to insure a firm footing. An accident several years ago shows the desirability of such cleats. A monkey boss slipped while botting the monkey and fell into the cinder fall or runner which was full of cinder. He received severe burns.

The use of an adequate shield, similar to the one shown in Fig. 3, in front of the tapping hole should prevent such injuries in any plant

**Table II**

## Summary of Data Regarding Causes of Accidents and Duration of Injuries

| | | Time disability ended | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | First week | | Second week | | Third week | | Fourth week | | Fifth week | | Sixth week | | Fa- |
| Cause of accident | No. | No. | Days | No. | Days | No. | Days | No. | Days | No. | Days | No. | Days | tal |
| Hand labor | 245 | 111 | 4.4 | 75 | 10.4 | 33 | 18.1 | 11 | 26.1 | 9 | 32.8 | 6 | 63.1 | . |
| Hand tools | 184 | 80 | 5.0 | 48 | 11.1 | 18 | 17.7 | 12 | 24.7 | 8 | 32.7 | 16 | 51.4 | 3 |
| Falling or flying material | 168 | 78 | 4.6 | 38 | 12.0 | 22 | 17.8 | 6 | 26.8 | 8 | 32.3 | 11 | 68.5 | 4 |
| Falls of person | 154 | 53 | 4.6 | 32 | 10.9 | 14 | 18.5 | 7 | 26.7 | 15 | 32.1 | 25 | 68.8 | 8 |
| Hot metal | 101 | 41 | 4.4 | 18 | 11.8 | 14 | 18.0 | 11 | 25.6 | 7 | 31.6 | 10 | 50.4 | . |
| Cranes, hoists, or rigging | 98 | 33 | 5.2 | 16 | 11.7 | 11 | 19.7 | 9 | 26.5 | 13 | 32.8 | 15 | 66.3 | 1 |
| Railroads | 68 | 23 | 4.9 | 14 | 12.9 | 7 | 19.6 | 3 | 26.3 | 1 | 30.0 | 11 | 60.1 | 9 |
| Hot water or steam | 59 | 18 | 5.1 | 14 | 12.2 | 10 | 18.2 | 5 | 24.4 | 3 | 31.3 | 9 | 51.5 | . |
| Machs. or machy. | 57 | 14 | 4.6 | 15 | 10.4 | 15 | 19.4 | 6 | 25.7 | 1 | 31.0 | 6 | 48.0 | . |
| Flames or explosives | 41 | 11 | 5.5 | 16 | 12.1 | 3 | 18.3 | 1 | 28.0 | 3 | 33.0 | 5 | 57.6 | 2 |
| Burns from cinder | 42 | 11 | 5.5 | 7 | 9.3 | 9 | 17.7 | .. | .... | 6 | 33.5 | 8 | 70.9 | 1 |
| Illness (infection) | 40 | 10 | 4.7 | 15 | 10.8 | 7 | 18.7 | 2 | 23.0 | 2 | 30.5 | 4 | 30.5 | . |
| Electric machinery | 38 | 17 | 4.2 | 12 | 11.4 | 4 | 19.0 | 1 | 28.0 | 2 | 30.0 | 1 | 132.0 | 1 |
| Hot flue dust | 31 | 5 | 4.2 | 12 | 11.3 | 4 | 18.3 | 2 | 26.5 | 2 | 32.0 | 6 | 50.5 | . |
| Asphyxiation | 21 | 12 | 5.4 | .. | .... | 4 | 18.5 | 1 | 25.0 | . | .... | 1 | 56.0 | 3 |
| Slips | 16 | 8 | 5.0 | 3 | 11.0 | 3 | 19.0 | 1 | 22.0 | . | .... | 1 | 70.0 | 1 |
| Fighting or playing | 3 | 2 | 2.0 | 1 | 8.0 | .. | .... | .. | .... | . | .... | .. | .... | . |
| Misc. | 6 | 3 | 6.0 | 2 | 11.0 | .. | .... | 1 | 28.0 | . | .... | .. | .... | . |
| Total or average | 1372 | 530 | 4.7 | 338 | 11.1 | 177 | 18.3 | 79 | 25.7 | 80 | 32.3 | 135 | 60.9 | 33 |

Proportion of nonfatal injuries after second week, per cent..... 35.1
Duration of injuries terminating after second week, days..... 34.1

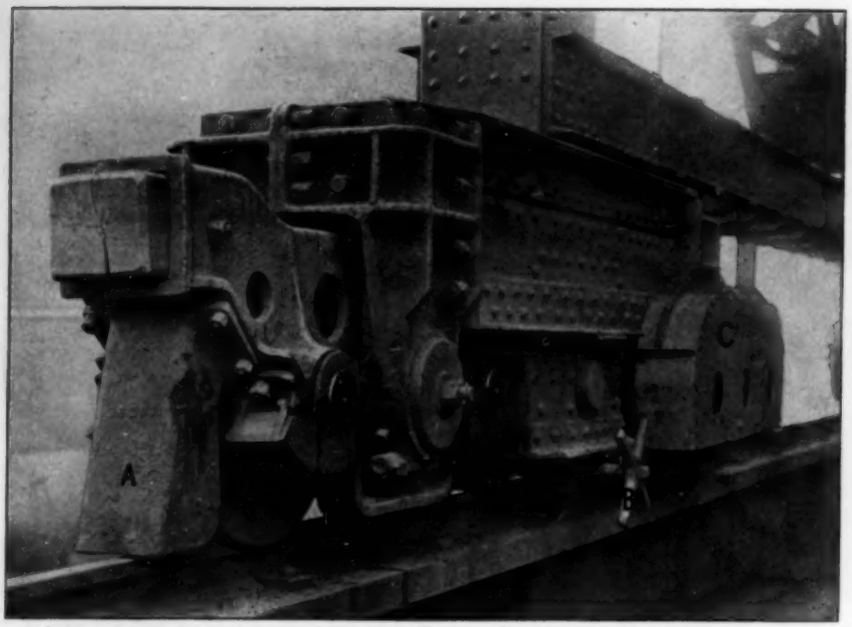



FIG. 6—ORE BRIDGE EQUIPPED WITH SAFEGUARDS
*A*, guard for wheels; *B*, device for clamping bridge to rails; *C*, guard for driving gears

where the bar is driven by hand.

Six injuries resulted from pulling bars from the tapping hole. As is evident from the review of accidents incurred while men were driving bars the iron at times comes out when the bar is driven. When the skull is heavy and thick and mainly composed of iron a "welshman" must generally be put on the bar, and it must be driven back by sledging the wedge. Two of the injuries were to men having hold of the handle of the "welshman". In one case the hole was a little "green" or wet, and when the bar was pulled an explosion threw particles of hot iron over the man's face and neck. Lost time, six days. A similar accident in 1914 caused erysipelas, pneumonia and death.

Two men suffered burns of shoulder, back and arms from flames and iron from the tapping hole when the tapping bar was pulled. Disability, three and 24 days.

*Other Accidents*

One man received slight burns of face and ear when the iron burst out while he was using oxygen to burn out a tapping hole in which a tapping bar was stuck.

The sixth accident occurred to a keeper pulling a tapping far from the hole after the iron had come. The iron splashed up over his foot. Lost time, 16 days.

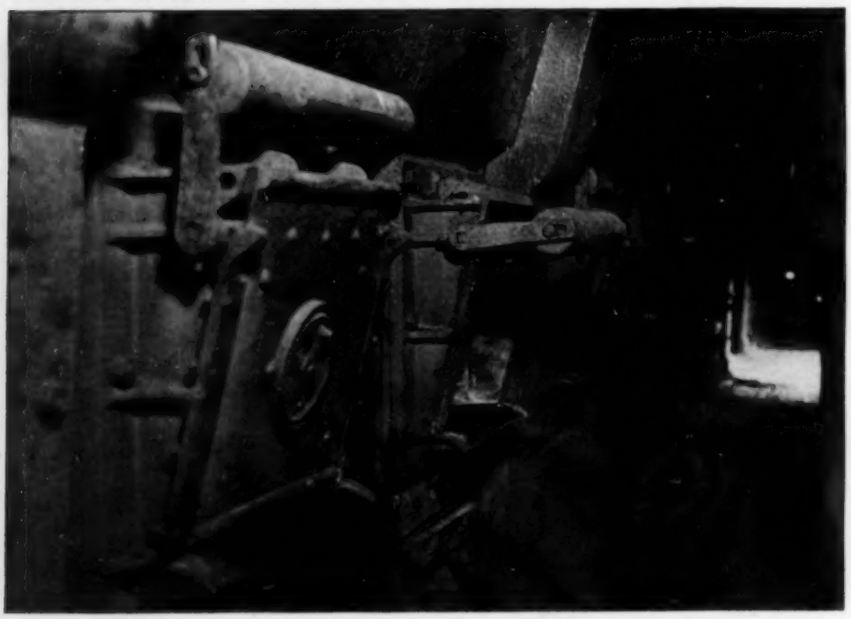


FIG. 7—COUNTERWEIGHTED DOORS ON BOILER; DOORS OPEN INWARD AND UPWARD

In pulling tapping bars the shield should be left in front of the hole until the bar is out; there is no necessity for removing the shield. In one plant, to enable the men backing the bar out to keep away from the trough, a sliding weight is placed on the bar and the men jar this against the "welshman" by yanking it up against the wedge with ropes attached to each side. In another plant, to enable men to keep away from the "welshman", a cable hooked into a clevis attached to the "welshman" by means of an eyebolt passes over a sheave to near the cast-house wall, where the "welshman" can be held at the desired height and pulled out of the trough when the iron comes and the tapping bar is free.

Men working about the tapping hole should always wear goggles and good shoes, tightly laced and not gaping away from the ankle or with cracks in uppers or soles. Leggings are used at few plants. They have, however, been found practicable in certain plants outside the state.

Men not actually employed in opening the hole should keep away, and if it is necessary to walk in front should get across the runner quickly. Some years ago a foreman was superintending work on a hard hole, and was standing directly over the dam in the trough. He was caught by a sudden outbreak in the hole, receiving burns of abdomen and legs which caused several months' layoff. Care should be taken to keep the legs and feet out of the trough, even on the first spell, and while working to stand as much to one side as possible. It is safest to place a shield and splasher, or cover plate, in front of or above the tapping hole after the first spell, as it occasionally happens that the hole is weak, "short," or "green," and unexpected outbreaks of iron are almost inevitable from time to time.

The use of roller tables or conveyors as shown in Fig. 9 instead of chutes for brick, together with some instruction in safe ways of taking the brick from the tables, should appreciably decrease the injuries from pinched fingers. The practice of tossing brick is to be discouraged when other means of moving them are available, as injuries are bound to occur. Injuries from the dropping brick on the hands and feet result from lack of skill or care, or from the hurry of the work and the fatigue of the men.

Fig. 7 shows blast-furnace boiler counterweighted doors which open in-

ward and upward, eliminating danger from any firebox explosion.

It goes without saying that safety work is of advantage to both employer and employe. Yet, in seriousness of burden, caused by unsafe conditions, the employer escapes lightly. With an accident rate of 500 per 1000 men, the estimated cost would be only $0.028 per ton of pig iron. The employe, on the other hand, stands one chance in two of partial impairment of earning power, amounting, on the average, to 2 to 3 per cent of his yearly income, not to mention his liability to loss in earning power of thousands of dollars by permanent disability. So it is true that accident prevention work on the part of the employer must rest on more than a desire for a good showing on the profit side of the ledger.

Another important inducement for the employer to provide the maximum of safety is embraced in the general labor situation. The mass of labor about blast furnace plants, except in one district, has been composed of immigrants, and the standard or level of wages has been the lowest of any department of the steel industry.

*Labor—A Future Problem*

It is a matter of record that Americans born of native or foreign parents are not attracted in large numbers to the industry. It is a live question as to whether it will be possible to continue to attract the immigrants, or whether with future changes of conditions in their native lands men will not cease to emigrate. It is more than likely that a future problem of the furnace industry will be to attract immigrants, or to attract American-born laborers, by making employment more inviting. The problem will be partly technical, involving the character of work to be required, and partly sociological, involving the conditions under which the work is performed. Development of safety measures, such as improvement of working conditions, that is, providing adequate sanitation, locker, bathing and lunch rooms, and drinking water facilities; encouraging better home life, conserving health; eliminating so far as possible fatigue and occupational diseases, and lessening the causes of dusts, gases, vapor and fume, excessive heat and cold, glaring lights will go far to supplement the work set for technical men in lightening and making more attractive the work performed about furnace plants. Thousands of dollars have been spent in this work and the tendency to make improvements is constantly growing. The record of many plants in this respect

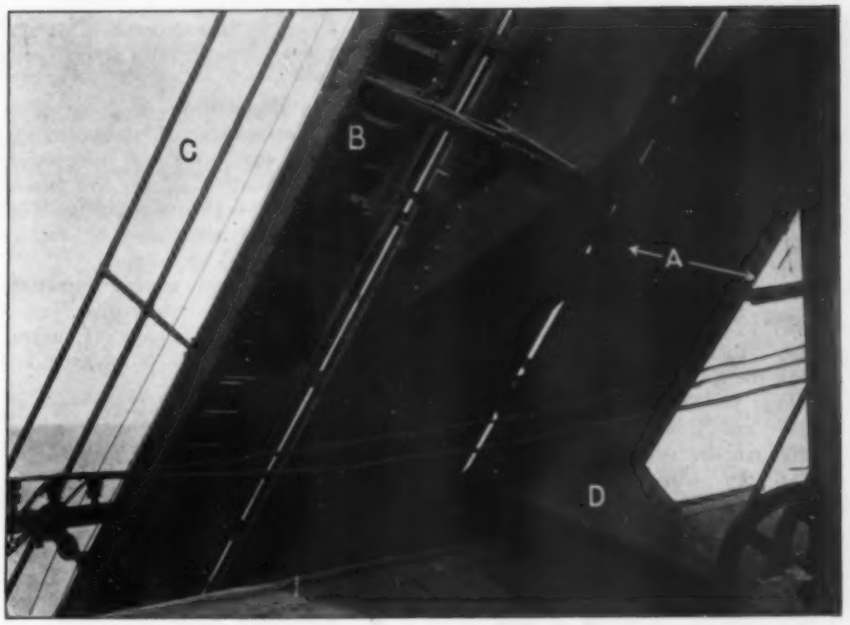



FIG. 8—SKIP INCLINE ADEQUATELY PROTECTED

*A*, steel-plate sheathing to prevent material from skip cars from falling on workmen passing below; *B*, stairway for workmen making repairs; *C*, handrail; *D*, chute for collecting falling material

is one of progress and recognition of their responsibilities, and there has been almost more betterment in conditions of employment in the past five years than in the preceding 50.

Safety work, therefore, should rest on a very secure conviction in the minds of both employers and employes that it is a decided necessity.

The feeling that prompts men to ignore little wounds is their experience that former slight scratches or cuts have not caused trouble. Added to this conviction of immunity is the reluctance to report the injury for fear that it will result in their being ordered to stop work for a few days. Loss of wages may be a serious misfortune to a man earning an average wage about a furnace plant. The experience of more than one large company in the last two years indicates that it is possible to shorten to a marked degree the lost time attendant on minor injuries. Efficient treatment of minor injuries prevents a serious loss of time for those injured, and consequently their reluctance to report their injuries disappears. The reduction of lost time attendant on slight injuries is one of the most important accomplishments to be achieved in getting men interested in safe methods of work.

FIG. 9—HANDLING BRICK BY ROLLER CONVEYOR, SAFELY AND EFFICIENTLY

## Canadian Mines and Ore Deposits

*(Concluded from Page 916)*

and blacksmith shop are located conveniently near the shaft.

All mine equipment is operated by electricity generated at Steephill Falls on the Magpie river, about 12 miles distant.

*Moose Mountain Mine*

Most of the deposits comprising the Moose Mountain mine are grouped around the village of Sellwood, province of Ontario. Sellwood is 82 miles distant by rail from Key Harbor.

Although the existence of deposits of banded iron formations had been known here since the early nineties it was only in 1901 that actual exploration was undertaken. The first development work was done in 1906 and in 1907 a small crushing plant was built. The first shipment of ore was made in 1908 when railway communication was established. The unfavorable reception which this ore was accorded because of its low iron content led in 1909 to the installation of a small magnetic cobbing plant, which was superseded in the following year by a larger and better equipped one. The enlarged plant continued in operation from August, 1910, to May, 1911, when it was closed down entirely, owing to unsatisfactory market conditions and to complaints made by buyers that the ore contained a too high percentage of fines. For the latter reason it was necessary to screen the ore before further shipment could be made. Since 1912 the fines have been treated by a Grondal concentrating and briquetting plant.

The ore deposits lie in a series of matamorphic schists of Archean age, the chief constituents of which are hornblende, chlorite, feldspar and quartz. The existence of 11 ore deposits of all grades has been established by surface and diamond drill exploration.

Up to the present mining operations have been confined to deposits Nos. 1 and 5, which consist chiefly of magnetite ore associated with hornblende and epidote.

The estimated ore reserves of the Moose Mountain district are slightly under 40,000,000 tons, the greater portion of which consists of fine-grained siliceous magnetite intervanced with siliceous material of both cherty and quartzitic texture. Experiments on the siliceous ore seem to indicate that 2.1 tons of siliceous ore are required to furnish one ton of concentrates averaging 65 per cent iron.

Concentrates necessarily have to be agglomerated in some way for satisfactory handling and for use in the blast furnace and this the owner of the mine has done by briquetting, the briquettes being burned in gas-fired kilns.

## Iron Ore Produced and Smelted in Canada From 1887 to 1917

| Calendar year | Production of iron ore in Canada short tons | Iron ore charged to Canadian blast furnaces: Canadian short tons | Imported short tons | Total short tons | Canadian ore in total ore charged per cent | Ratio Canadian production to total ore charged per cent |
|---|---|---|---|---|---|---|
| 1887 | 76,330 | 60,434 | ..... | ..... | .... | .... |
| 1888 | 78,587 | 54,956 | ..... | ..... | .... | .... |
| 1889 | 84,181 | 65,670 | ..... | ..... | .... | .... |
| 1890 | 76,511 | 57,304 | ..... | ..... | .... | .... |
| 1891 | 68,979 | 60,933 | ..... | ..... | .... | .... |
| 1892 | 103,248 | 96,948 | ..... | ..... | .... | .... |
| 1893 | 125,602 | 124,053 | ..... | ..... | .... | .... |
| 1894 | 109,991 | 108,871 | ..... | ..... | .... | .... |
| 1895 | 102,797 | 93,208 | ..... | ..... | .... | .... |
| 1896 | 91,906 | 96,560 | 46,300 | 142,860 | 67.6 | 64.3 |
| 1897 | 50,705 | 53,658 | 55,722 | 109,380 | 49.0 | 46.3 |
| 1898 | 58,343 | 57,881 | 77,107 | 134,988 | 42.9 | 43.2 |
| 1899 | 74,617 | 66,384 | 120,650 | 187,034 | 35.5 | 39.9 |
| 1900 | 122,000 | 71,341 | 112,042 | 183,383 | 38.9 | 66.5 |
| 1901 | 313,646 | 156,613 | 361,010 | 517,623 | 30.2 | 60.6 |
| 1902 | 404,003 | 125,664 | 559,381 | 685,045 | 18.3 | 58.9 |
| 1903 | 264,294 | 82,035 | 485,911 | 567,946 | 14.4 | 46.5 |
| 1904 | 219,046 | 180,932 | 454,671 | 635,603 | 28.4 | 34.4 |
| 1905 | 291,097 | 116,974 | 861,847 | 978,821 | 12.0 | 29.7 |
| 1906 | 248,831 | 221,733 | 982,740 | 1,204,473 | 18.4 | 20.7 |
| 1907 | 312,856 | 244,104 | 1,117,260 | 1,361,364 | 17.9 | 22.9 |
| 1908 | 238,082 | 209,266 | 1,051,445 | 1,260,711 | 16.6 | 18.8 |
| 1909 | 268,043 | 231,994 | 1,235,000 | 1,466,994 | 15.8 | 18.3 |
| 1910 | 259,418 | 149,505 | 1,377,035 | 1,526,540 | 9.8 | 17.0 |
| 1911 | 210,344 | 67,434 | 1,628,368 | 1,695,802 | 4.0 | 12.4 |
| 1912 | 215,883 | 71,588 | 2,019,165 | 2,090,753 | 3.4 | 10.3 |
| 1913 | 307,634 | 139,436 | 2,110,828 | 2,250,264 | 6.2 | 13.7 |
| 1914 | 244,854 | 182,964 | 1,324,326 | 1,507,290 | 12.1 | 16.2 |
| 1915 | 398,112 | 293,305 | 1,463,488 | 1,756,793 | 16.7 | 22.6 |
| 1916 | 339,600 | 221,773 | 1,964,598 | 2,186,371 | 10.1 | 15.5 |

N. B.—This table is compiled from the figures given in the annual reports of the Division of Mineral Resources and Statistics, of the Mines Branch, Ottawa.

# Study Post-War Problems

THOUGH peace terms and negotiations seem possibilities of the dim future, Great Britain vigorously is turning her head and hand to post-war problems. The British ministry of reconstruction has published a complete list of commissions and committees that have been created in various government departments to deal with questions which will arise when victory is won. Since the war began 87 commissions and committees have been appointed and these form 15 groups, which, with the number of committees to each, follow: (a) trade development, five committees dealing with general aspects and nine dealing with specific phases of the situation; (b) finance, two; (c) raw materials, six; (d) coal and power, two committees and four subcommittees (e) intelligence, two; (f) scientific and industrial research, two research boards, five standing, seven research, four inquiry and three provisional organization committees; (g) demobilization and disposal of stores, eight; (h) labor and employment, two; (i) agriculture and forest, four; (j) public administration, six; (k) housing, four; (l) education, eight committees and commissions; (m) aliens, two; (n) legal, three, and (o) miscellaneous, with three committees.

Consul General Robert P. Skinner at London states that special study is being given to carrying out the conclusions reached at the Paris trade conference and to meeting the changed trade conditions of the world after the war.

Measures are being devised to prevent an effective resumption of Germany's policy of peaceful penetration. Staples not made in England before the war are hereafter to be manufactured there, and especial attention is being given to the chemical and dye trades. In view of the heavy consumption of England's coal supply, effort is being exerted to establish a general policy of conservation.

The problem of atmospheric fixation, which has been such a powerful element of Germany's military advantage, is among the problems that the ministry of reconstruction is working upon. Another problem under consideration is the demobilization of the vast amount of labor diverted from its original occupations to war trades.

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Pickands, Mather & Co. have issued an attractive 20-page booklet devoted to analyses of ores from their mines.

# Standardized Cars Take Much Steel

## Exclusive of Castings, Each Unit Calls for 15 to 19 Tons of Material—Approved Specifications Cover Many Parts—Both Cast Iron and Steel Wheels Will Be Used

NEW YORK April 9.—Car builders have submitted prices to the purchasing department of the railroad administration covering the various types of equipment for which standard specifications have been adopted. These bids are being studied and carefully checked preliminary to the reaching of a decision on how many cars will be purchased. There is also further consideration to be given to the appliances which will be used on the various types of cars. Until these matters are threshed out nothing may be expected with regard to a definite allotment of equipment.

The character and weight in net tons of the iron and steel requirements of each type of car exclusive of the castings are as follows:

| | 70-ton capacity | | 50-ton capacity | |
|---|---|---|---|---|
| Material | Hoppers, tons, per car | Gondolas, tons, per car | Hoppers, tons, per car | Gondolas tons, per car |
| Plates .. | 9.583 | 9.855 | 7.334 | 7.105 |
| Bars .... | 0.811 | 1.039 | 1.270 | 1.005 |
| Shapes... | 3.761 | 2.820 | 2.916 | 3.006 |
| Bolts and nuts .. | 0.115 | 0.098 | 0.100 | 0.097 |
| Rivets .. | 0.531 | 0.578 | 0.476 | 0.428 |
| Axles .. | 2.014 | 2.014 | 1.658 | 1.658 |
| Wheels... | 2.600 | 2.600 | 2.600 | 2.600 |
| Total.. | 19.415 | 19.004 | 16.354 | 15.899 |

*What Specifications Cover*

Specifications for the standard car types recently approved by the director general cover axles; bolts and nuts; brake beams and shoes; carbon steel bars for railway springs; cast-iron wheels; cast-steel bolsters and truck side frames; steel wheels; cast-springs; journal bearings; malleable iron castings; mild steel bars; steel castings; pressed steel bolsters; rivet steel and rivets; structural steel, steel plates and steel sheets for freight equipment cars; and wrought iron bars.

All bolts are to have square head and nut unless otherwise specified. Bolts for securing steel against steel are to have cotters, lock washers and lock nuts, in addition to common nut, and all bolts for securing wood against steel are to be riveted over nuts. The cars are to be equipped with KD-10-12 type of air brakes of either Westinghouse or New York Air Brake Co.'s manufacture. The brakes to be applied to all wheels. All piping to be black steel, merchantable, standard weight, and fittings to be malleable iron.

The draft gear is to be of the friction type, having a minimum capacity of 150,000 pounds. The drawbar yoke is to be of the vertical plane type of an improved design. The coupler is to be cast steel, in accordance with M. C. B. contour and specification. The center plate is to be (1) drop forged, or (2) cast steel. The side bearings are to be frictionless or plain. Frictionless side bearings to be of approved type. Plain side bearings can be used in repairs.

*No. 22 Sheets Required*

All box cars will have steel ends and underframes. The only difference in the bodies of the 40 and 50-ton single-sheathed box cars is in the trucks. The roof is to be galvanized steel No. 22 gage. The steel ends are to be (1) horizontal corrugated of three sheets; top sheet 3/16-inch thick, intermediate and bottom sheets ¼-inch thick with corrugations 2¼ inches deep; (2) vertical corrugated of two sheets, all ¼-inch thick with corrugations 2¼ inches deep; (3) plain steel ends with U-shape vertical stakes.

All hopper cars are constructed of steel throughout. The trucks for all the standard cars are covered by three specifications, one for the 40-ton cars, one for 50-tons cars and one for 70-ton cars. The truck frames for the 40 and 50-ton trucks are to be cast-steel side frames of U-section members with M. C. B. standards removable journal box; cast-steel side frame of U-section members with journal box cast integral; or arch bar type. Except for the exclusion of the arch-bar type, the same types of side frames are specified for the 70-ton truck. Tie bars for the cast-steel truck side frame are to be of the short type and two per frame.

The truck bolsters are to be cast steel with separate center plate, cast steel with integral center plate, or pressed steel. Cast-steel and built-up steel bolsters. Cast-steel bolsters must have a section modulus vertically 10 per cent greater than pressed-steel bolsters. Built-up bolsters must be as strong vertically as pressed-steel bolsters. All bolsters to have a transverse strength at least 50 per cent of vertical strength.

The center plates are to be drop forged or cast steel. Each 40 and 50-ton truck is to be equipped with two M. C. B. No. 2 brake beams, and each 70-ton truck with two M. C. B. No. 3 brake beams. The brake shoes are to be made with a reinforced back of cast iron. For the 40-ton truck, the wheels are to be M. C. B. standard for cars having axles with 5 x 9-inch journals. They are to be made of cast iron and weigh about 700 pounds each.

For the 50-ton hopper cars, the wheels are to be made of wrought steel, cast steel, or cast iron. For all other 50-ton cars, the wheels are to be of cast iron. They are to be M. C. B. standard for cars having axles with 5½ x 10-inch journals. Cast-iron wheels are to have a nominal weight of 725 pounds each.

The wheels for the 70-ton truck are to be M. C. B. standard wrought steel, for cars having axles with 6 x 11-inch journals. The axles are to be of open-hearth steel, smooth forged or rough turned between wheel seats and journals to be burnished. They are to be made in accordance with M. C. B. specifications with sulphur and phosphorus content modified to limit of 0.06 per cent. The journal boxes are to be of malleable iron, cast or pressed steel, complete with lids. The bearings are to be of brass, lined with lead. The bearing wedges are to be of drop forged or cast steel.

The railroad administration has prepared specifications for light and heavy types of the Mikado, Pacific and Mountain locomotives, and 6 and 8-inch wheel switch engines. These have been gone over by the locomotive builders and prices have been submitted.

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## Develop Sand Pits

Two large silica sand properties in Columbia county, Wis., recently have been purchased by new interests who will develop the properties for the use of foundries, glass factories, etc. F. A. Runkle of Portage, Wis., has purchased the property of the Silica Sand Corp. in Pacific. J. N. Hays, also of Portage, represents interests which have purchased a 33-acre tract in Columbia township, and is now preparing articles of incorporation.

# Don't Need Women in Industry–Now

## Whole Question of General Employment of Women Due to Labor Dislocation by War, Studied and Analyzed in Comprehensive Fashion—Long War Will Make Problem an Acute One—Unions Won't Suffer

BY C. E. KNOEPPEL

*PARAMOUNT among the many important problems engrossing the minds of employers in these war times, is that of women in industry. With millions of places left vacant by the call to arms a possibility of the near future the industrial world is wondering how this slack best can be taken up. This question, when and whether women workers will be extensively needed and what preparation should be made for that contingency are ably answered in the paper presented by Mr. Knoeppel of C. E. Knoeppel & Co., New York City, industrial engineers, before the recent national conference on war's labor problems at Chicago.*

*ANSWERS to 1000 comprehensive questionnaires sent out by Mr. Knoeppel furnished the basis for an important discussion and conclusions on his paper. That women are not needed now but will be; that the present is the time not only to profit by Great Britain's experience of 1915, but to prepare for the recruiting of women workers; that ships are closely related to their entering the industrial army, and that there should be no antagonism to the movement by labor unions if the matter is approached by proper stages are some of the outstanding convictions he expresses and supports by various facts and statistics.*

IN CONSIDERING this great subject, the first question to answer is whether or not we need women in large numbers in industry. To do this, three important factors must be taken into consideration:

The present military situation.
German strategy.
The shipping situation.

Germany, in addition to controlling the destinies of Austria-Hungary, Turkey and Bulgaria, is to all intents and purposes, mistress of Serbia, Belgium, Poland, part of France, part of Italy, Roumania and Russia. This gives Germany access to rich deposits of minerals; oils; vast wheat fields; the labor of conquered areas, through deportations; her several million prisoners of war, who are trained men, and the many hundreds of thousands of soldiers from eastern sections whom she can concentrate on the western front.

Can Germany break through, take Paris and then attack England? The foremost military expert in this country states that the result on the western front is a military stalemate. It has been demonstrated that no frontal attack by either side against the other, can break through, nor can the long, thin line be turned, with Switzerland at one end and Holland at the other. Can Germany be beaten economically? Not according to Ex-Ambassador Gerard, who knows the situation from four years of first hand study. Even if Germany gives up her captured territory, Pan-Germany will be an established fact with a population of 150,000,000, capable of maintaining an army of 30,000,000.

Truly, not a pretty picture when we see, after nearly four years of war, a successful conquest on the one side and a successful defense on the other.

### *The German Strategy*

What is the reason for the above condition? Military preparedness? Yes, to some extent, but not altogether. Germany planned for a short war, but had to plan again and build a new machine. The allies, as they were for three years, were in a much better position from the standpoint of materials, men, money, command of the sea and ships. What accounts for the successful conquest of Serbia, Roumania, Russia and part of Italy, while Germany was holding the western front? German strategy, a fact admitted by Lloyd-George on Nov. 12 last.

I wish everyone here could read that admirable and illuminating article "Political Strategy", by Andre Cheredame in the March issue of *The Atlantic Monthly*. The conclusion and findings of this remarkable man, who has studied the terrible strength of Germany for twenty years, are nothing short of uncanny. He states that from the battle of the Marne, down to the offensive against Italy, a period of 38 months, the whole strategy of Berlin was based on a plan developed in 1895. The remarkable thing about it is that this man submits a copy of a map contained in a booklet published in 1895 entitled "Greater Germany and Central Europe about 1950". The similarity between the map of 1895 and the performance of 1917 is sufficient evidence that there was more to it than just the military aspect. Plan and strategy are responsible.

### *The Shipping Situation*

Since the allies are not at maximum efficiency, it will take from three to seven years to defeat Germany

decisively, and the reason the allies are not at maximum efficiency is lack of ships. If we cannot maintain a big army abroad through lack of ships, enormous quantities of aircraft, rifles, locomotives, trucks and automobiles, at the present rate of manufacture, will pile up in our ports, which will bring about industrial disorganization, as we will have to stop making war products, all of which shows that the key to our successfully waging this war is ships. If we can't get ships, and unless we double or triple our ship construction, it means but one thing, wait until we can get ships enough to put over the real American punch. We are going to get the ships, and they will be built faster than they are sunk, and when we have them we will put our army and supplies into Europe, which, with the allies, will put over the knockout. But not until every man and every woman, every boy and every girl, have done, not only their bit, but their utmost to win the war.

So you see that from the standpoint of the present military situation, the superior political strategy of the Germans, and the lack of shipping, a long and bitter war is ahead of us, requiring millions of men in the field.

We are told that the plan is ultimately to have 5,000,000 soldiers abroad. It is estimated that it takes 6½ persons in industry to maintain a soldier. This means an army of 37,500,000 persons. Statistics show that there are 45,000,000 between the ages of 18 and 45, 4,500,000 between 15 and 20, and 6,000,000 between 45 and 60, a total of 55,500,000 available. Taking from that the 37,500,000 needed in war pursuits, 18,000,000 are left available for regular activities.

As I see it, this answers the question as regards whether we will need women in industry or not. We will need them in increasing numbers before Berlin capitulates. If we are to win the war, it will be when 100,000,000 of us get behind the war as one man, giving time, money and, if necessary, lives, to the cause. Multiply all the latent ability and resources of each person by 100,000,000 and what will we have? The kaiser in exile. If we don't, he may decide to move his capital to Washington, from which point he would rule.

# Are Women Needed in Industry Now?

WE WILL need women in industry, of that there can be no question. Do we need them now? My study does not indicate this, but it does indicate conclusively that later on we are going to need them in increasing numbers, and that now is the time to prepare and develop plans and policies so that when we begin to properly utilize their abilities we will be able to proceed along logical, fair and well-planned lines. The reason that we do not need women in industry now, is simply because we are not using our man power to the extent possible, nor as efficiently as we can.

In jails are men who under guard could be put to work in industrial or agricultural pursuits. Elderly men who have retired could perform work of a lighter character. Tramps, street loafers should be put at productive occupations. Workmen who take time off should be kept busy. We could take the cripples and the blind and teach them to be helpful—we have got to do it after the war—why not now? There are several million of male and female enemy aliens who could be placed at work under guards. We can also arrange for a carefully worked-out and properly executed plan of labor dilution, wherein a portion of the force in an efficient shop would be placed at the disposal of a less efficient plant. This by no means exhausts the list of places where men could be found, whose places, or most of them, could be filled by women.

In short, my claim is that we should first use the women in the lighter occupations in order to utilize our man power properly and avoid exploiting women, or putting them at industrial work before industry is ready for them, and my analysis indicates that industry is not ready for them as yet. By ready I mean providing safeguards, proper training, careful selection and the like.

This leads me to the conclusion that we need a policy, a plan of action, with the government behind it, and organized labor and the manufacturers of the country co-operating to the fullest.

# The Broad Experience of Great Britain

THAT it takes 6.5 persons in industry to maintain a soldier, is sufficient evidence that military success depends entirely upon industrial success, and as yet we have not struck our stride industrially. A great deal remains to be done to get both capital and labor to co-operate with each other and with the government.

We can well consider the lesson that England was forced to learn. When the war was started, plans were made for the making of necessary munitions by employing women and inaugurating longer hours, overtime work and by speeding up production which had previously been strictly limited by the rules of the powerful English labor unions. When the plans were completed labor squashed them by refusing to work under conditions imposed. There was much talk of labor's lack of patriotism, though thousands of those who have laid down their lives for England were drawn from its ranks. Then the idea finally seeped in that it would be necessary to ask labor what it was willing to do before making additional plans.

The press of the world was quick to condemn the attitude of British workmen. While there was little that was commendable in their action, still it is probable that it was largely due to the methods used in dealing with them. This conclusion is justified by the later action of labor, after it had been taken into the councils of the government in placing all hard-earned rights, privileges and restrictions on

output upon the altar of the war god, enabling the employers to dilute labor, employ women, install automatic machinery, etc, so the men at the front might have shells, ammunition and other war needfuls.

How did England bring this all about? Miss Frances A. Kellor gives a concise description in her address on "Industrial Americanization":

First of all, England defined munitions work to cover the manufacture and repair of everything intended, adapted or suitable for use in war, including even housing of workmen. The result is that she has little difficulty today defining nonessential and essential industries.

A next important step was the suspension of trade customs. If there is controversy it goes to arbitration. This means any man can work at any job, skilled or unskilled, that women can be employed and all shops are open shops. At the same time, unions were protected. It is also provided that any departure during the war from any prewar practice shall be only for the period of war.

A very important action was the establishment of controlled industries. The minister of munitions has power to declare any establishment adapted for use in war a controlled industry. Wages were limited in such establishments, and when an employe changes from one to another where the rate is lower he is given a bonus to cover the difference. If workmen will agree to stay in such controlled establishments for six months, they are designated as munitions volunteers and get the standard rate of wages.

Employers are prohibited from soliciting by advertising or from inducing workmen in other industries to leave their work. Boards handle the dilution of labor for each industry. The mixing of skilled and unskilled workers and of women is carefully done. Strikes and lockouts have been made practically impossible. All such controversies go to the trade board. If it fails to deal with them, they go to arbitration boards for final award. The law not only deals with all concerted action involving a stoppage of work, but it penalizes any person who attempts to impede, delay, or restrict production, repair or transport of war material or any other necessary war work. A complete system of labor exchanges, nearly 400, is in operation.

What has been the result? An industrial efficiency in Great Britain undreamed of by the most radical efficiency crank. In England, having less than 50,000,000 population, there are, according to Helen Fraser, 1,250,000 women in industry replacing men, 1,000,000 in munitions making, 80,000 in government departments, 250,000 on farms, 10,000 per month are joining the women's army auxiliary corps, and 60,600 are in volunteer Red Cross work.

It takes from six to eight weeks to make the average English woman fit for the simpler operations on shells, shell parts and fuses, while the more intelligent in this line become lathe hands and tool setters. The British government has established 50 training schools since the war and thousands of women are being schooled in industrial activities. Most of the large plants have their own training classes.

# Our Own Experience Up To This Time

MY STUDIES of the labor situation indicate that we are passing through Great Britain's experience during the first year of the war; that we have no well defined male or female labor program; and that there has not been the proper three-sided co-operation between employer, employe and the government. We have had strikes; we still have competition between manufacturers for workers, and we had to resort to a national advertising campaign to get shipworkers. We put enemy aliens outside of prescribed zones, without creating machinery to put them in productive occupation. We have withdrawn men from industry by the thousands with no program for replacing them. There are state, city, trade union and manufacturers' association employment bureaus and about 5000 private employment agencies. Employers say they cannot get help and must have women labor. Organized labor replies that there is no shortage of labor.

I agree fully with President Wilson and Secretary Baker, that we must protect and safeguard workers, especially women and children. I go on record by saying that we do not need women in industry now, if present man power can be made more efficient and we can recruit men from the lighter occupations. I go on record by also saying that in all discussions of plans and policies governing labor during war times labor should be presented, and now the council of national defense, the ordnance and labor departments all have woman's divisions.

# Analysis of Countrywide Questionnaire

WITH a long war confronting us, calling for utmost effort, it is apparent that we will have to call upon the women in increasing numbers. It is further evident that we do not need women in industry to any great extent now. What is needed is a plan for the time when the need for women in industrial plants becomes pressing. In other words, we must first use our man power as efficiently as possible; then take men from the lighter occupations, substituting women, and then call upon the women for industrial work, during all of which time we should be so shaping things that women may be able to work to best advantage when the call comes.

The questionnaire had to do with location, selection and training of women; conditions—working, living and social; the work to be done by women; hours, fatigue and wages; existing laws; co-operation of the labor unions; women's organizations and the government, all of which are essential considerations in any intelligent presentation of the subject. It attracted no little attention. Answers were a revelation and a disappointment. A revelation, in that the general trend was thoroughly American, and showing conclusively that organized labor has nothing to fear from the manufacturing world on this question of women in industry. A disappointment in that there was a lack of plan and co-operation. No coordinated action so necessary in the successful solution of the problem existed.

From the answers received, manufacturers had no well-defined views as to what work women should do. A few felt that it would be unnecessary to subdivide operations. The concensus of opinion, however, was that work should be studied with the view to subdivision, in order that women might perform the lighter and less complex tasks and men the heavier and more complicated work.

After determining the nature of

work which women can perform with safety, the task becomes one of finding the women. Analysis of the answers to the questions revealed that there were a number of avenues of approach. A great many felt that as we become more and more organized for war, the nonessential industries employing women could contribute to the supply of female labor. Unquestionably, a great many women could be recruited from the ranks of those known as household servants. Childless married women could give all their time and the married women with grown-up families could serve part of their time. The so-called idle or leisure class could contribute many women to assist and many other unemployed women would like to work. A large number of wives and sisters of soldiers who have gone to camps or to the front, and a large number of women from rural districts could also be recruited. A review indicates that there would be plenty of women to draw from if they are needed.

The next point is how to induce them to enter industry. The concensus of opinion was that if wages for women are to be the same as paid men for the same work; if conditions are made both attractive and such that women can work without injury to their health, there would be no question about getting them to respond, should an appeal be generally made for women, through various means.

Knowing the work that women can do, and having worked out plans for inducing them to apply for work, the next step is that of selection. This problem seems easy of solution according to the answers received—simply match qualifications against requirements; find the women who can work and then train them.

### *Training the Women*

Many of the women who apply for industrial work will be unfamiliar with factory work or the operation and handling of machinery, so that the matter of training becomes doubly important. It will be necessary to organize a system of competent instruction, if the change is to be made rapidly and efficiently.

Women hired should be immediately turned over to an instructor who should stay with them until they perform the operation as taught and return at intervals to watch progress. Instructors should be selected for their ability to explain things clearly; for pleasing personality, tact, patience, etc.

The matter of wages, hours of work and consideration of fatigue is most important. The principle "equal pay with men for equal work" was subscribed to by practically all who answered the questions, although several felt that earnings in advance of those paid men should be offered to attract women workers.

In analyzing the questions as to hours, rest and fatigue, the conclusions were, no night work, overtime or Sunday work; half Saturdays off; an 8-hour day, with a rest period in the morning and afternoon, in addition to the lunch period, and varying from 10 to 20 minutes. It was also felt that physicians, nurses or matrons should be employed to observe the conditions of women.

The question of the health of the woman worker is of vital importance, and too much emphasis cannot be put upon it.

Another very important factor in connection with the utilization of woman labor is the matter of the conditions under which they work. If they are not right, the result will be discontent and dissatisfaction. The shop is a second home. If this thought is made the basis for improvement in working conditions, there will be a much better relationship between workers and employers.

Women should first start on the lighter tasks, and as they become proficient can take up heavier work, and under no consideration should they be placed at what might be called dangerous occupations. Women should be segregated if this can be done, either by new buildings or rearrangement of departments or machines.

The contentment of a woman employe might be said to depend one-third on wages and working conditions, one-third on living conditions and one-third on good, wholesome amusement. The question of amusement is an important one and seldom receives the consideration which it deserves. Amusements are simple to provide, as they should be made self-supporting. Let the women determine their own social distinctions and run their own clubs. All you need to do is to supply the initiative to start them. Never deal with your employes on a charity basis. Let them pay for what they get.

It was felt, according to the answers received, that the labor unions would not take kindly to the introduction of women labor. The clash that is ever with us between capital and labor is another reason why this matter of employing women will not be settled without considerable discussion between workers and employers. This will be especially true if the labor leaders take the stand later on that there is no shortage in labor.

In the first place, no wholesale attempt should be made now to employ women. Man power should first be used fully and efficiently. Plans for women in industry should now be worked out, however, for in the event of a long war, which seems likely, women will be needed to the fullest extent. To this end steps should be taken by the government, by manufacturers and by women's organizations to make organized labor realize the seriousness of the international situation. It should be made plain to labor that no displacement of men will be made when men are available; that men returning after the war will be given work to do—and this must be a government promise. No difficulty should be encountered if in the use of women there are the following considerations: Equal pay for the same work; same hours; right of women to organize; suffrage, and maintenance of proper working, living and social conditions.

### *Post-Bellum Considerations*

The question, "What about woman labor after the war?" is a most important one. One of the reasons labor is opposed to women in industry is its fear that women will remain to displace men after the war is over, which makes a consideration of this point very necessary. Many of those who answered the questions felt that the situation would take care of itself when the war was over.

The general feeling was, however, that the men who return should be given back their old jobs or that new work should be found for them; that home would make the real appeal to women and many would drop out for this reason. Several other factors must also be taken into consideration. Many foreigners will return to their home countries after the conclusion of peace. This will make large gaps in the ranks of industrial workers.

As a constructive measure a national commission should be appointed by the government or the war labor administration to consider this very point, and work up a logical plan of demobilization of women in industry; of maintaining the army as it returns and releasing the men to industry gradually, so as not to dump millions of them on the labor market before plans for the handling of both male and female labor have been worked out. Conferences with these ends in view, between labor unions, women's organizations, employers' associations and the government should also be arranged for, as well as a program of co-ordinated action between the employment bureaus of the country.

# Plate Output Ahead of Ship Needs

## Backwardness of March Vessel Production Shown Not to be Due to Failure of Mills—Steel Deliveries in First Quarter Exceed Requirements—Burden Put on Yard Management

WASHINGTON, April 9.—The point made by THE IRON TRADE REVIEW last week that the burden of the shipbuilding program now rests to a large extent with the plate mills, was thrice emphasized later in the week by J. Leonard Replogle, director of steel supply, of the war industries board. Stress was laid upon the plate mills' part in the program by Mr. Replogle in a letter to Charles Piez, vice president and general manager of the Emergency Fleet corporation, in testimony before the senate commerce committee, and in a statement to THE IRON TRADE REVIEW.

While the steel director's statements all emphasized the importance of unhampered plate production, they also very sharply called attention to the fact that any shortages which have occurred at the various shipyards or any which occur in the immediate future, have been due to lack of information from the corporation and the shipyards. Mr. Replogle said the steel industry has not been to blame for this condition and that he intends to defend the industry against attempts which may be made to place undue responsibility on the mills.

### *Failed to Give Requirements*

Mr. Replogle's letter to Mr. Piez very frankly declared that the Fleet corporation has failed to make known its requirements as repeatedly asked by the steel director at various times since last November. His letter pointed out that the production of ship steel in the first quarter this year was in excess of the shipyards' requirements but that the so-called shortage was due to faulty instructions which resulted in some yards receiving less. This letter set forth month by month the production of plates and shapes as against the requirements, each month showing a surplus production.

While it is held inadvisable to make public the figures set forth by Mr. Replogle, it is, however, permissible to say that the steel delivered to the railroads for shipment to all yards in the first three months of the year was at a rate sufficient to build 550,000 tons of shipping a month, or more than 6,000,000 tons a year. This production rate, from the war industries board's point of view, is sufficient for the American merchant marine. In the week ending March 30, ship steel production reached 12,00 tons more than in any previous week in history.

But sufficient steel for American shipyards is not enough, Mr. Replogle emphatically declared. The demand for plates for England, which is urgent, the requirements for the railroad administration's car and locomotive building program, the orders booked for the navy's destroyer and eagle-boat schedules, the obligation of the United States to furnish plates in exchange for Japanese shipping, and several other equally important tonnage requirements, all are going to force sheet, plate and shape mills to roll steel as they never have before, Mr. Replogle said.

### *Fleet Orders Promptly Filled*

Plate mills now are producing steel at 65 to 70 per cent of capacity, with Emergency Fleet orders receiving 100 per cent attention, Mr. Replogle assured the commerce committee of the senate. If the supply of raw materials, chiefly coke for pig iron, is kept up to requirements, and railroad transportation does not fail, shipyards should encounter little difficulty in the future, Mr. Replogle declared. With this object in mind, last week he conferred with Carl R. Gray, director of transportation in the railroad administration, and traffic managers of several leading coal-hauling roads with the result that sufficient cars will be supplied to keep in blast the furnaces serving the ship steel mills.

The shipping trouble, as far as steel is concerned, goes back to the days before the importance of ships was driven forcibly home, before the joint regime of E. N. Hurley, chairman of the shipping board, and Mr. Piez. Then orders for steel were placed regardless of the location of the mills in relation to fabrication plants or of the subsequent matter of delivery to shipyards. Some of those tonnages were reallocated, being given to mills nearer the fabrication plants, saving many thousands of ton-miles. New tonnages now are placed accordingly.

Emergency Fleet officials ten days ago attempted to shift the blame for the shortage of steel to the steel manufacturers. This was regarded generally as an unfair attitude and from the tone of a letter sent out later by Messrs. Hurley and Piez to all the shipbuilders, it is believed the real heads of the ship program recognize the fault really lies with the yards themselves, as stated by Mr. Replogle in his communication to Mr. Piez. The message to the shipbuilders said in part:

"Money, material and men have been supplied without stint by the nation. The keynote of the present situation is management—leadership. We are anxious that you should keep us fully informed concerning all causes of delay encountered in building ships this month, daily, by wire, if necessary. We will welcome any suggestions which you wish to make and if in your opinion the fault lies with the Emergency Fleet corporation, do not hesitate to advise us. We are holding you personally responsible for the successful management of your property. The American people want ships, not excuses."

The letter did not ask if the fault lay with the steel mills. No mention of them, or the lumber yards, was made. But the letter did show what had been done in steel shipbuilding in March. It said only 21 steel vessels, aggregating 166,700 tons, were delivered during March and that the minimum had been set at 197,075 tons. This estimate, the shipping chiefs said, had been made on estimates of shipbuilders. Thirty steel ships were launched for an aggregate tonnage of 219,586 tons, as against 11 wooden ships of approximately 40,000 tons.

### *Charged Slow Steel Delivery*

The request asked of the shipyards and Mr. Replogle's letter to Mr. Piez followed the charges of George J. Baldwin, chairman of the board of the American International Shipbuilding Corp., that failure of the steel mills to make prompt deliveries was responsible for the Hog Island yard falling behind in its schedule. His charge was made before the senate committee and was somewhat similar to a statement made earlier in Philadelphia by F. T. Bowles, assistant general manager of the Fleet corporation, that mills would have to deliver 50,000 tons of steel more in April than this month otherwise would require.

While Mr. Replogle was testifying before the senate commerce committee on the question of ship steel, Eugene G.

Grace, president of the Bethlehem Steel Co., which is also heavily obligated in the shipbuilding program, both as a producer of steel and as a builder of ships, was testifying before the military affairs committee in secret session on the matter of ordnance steel for the army's artillery program. It is understood that he pointed out the labor and housing problems as the vital questions affecting the contracts his company holds.

# Will Not Deal With Scrap Men Direct

WASHINGTON, April 9.—Present indications are that iron and steel scrap dealers will have to do business the remainder of the quarter without the 3½ per cent commission for which they have been bending every effort the past few weeks. Following the refusal of the steel products committee of the American Iron and Steel institute to sanction additional compensation on scrap sales other than those approved by the President, the war industries board's price-fixing committee appears to be lending a deaf ear to the deluge of telegrams and letters which have been asking authority for the commission.

As far as the question concerns the price committee of the war board, it has been learned authoritatively that the committee will have nothing to do with it unless the matter is formally presented by the institute's committee in accord with the plan laid down by R. S. Brookings, chairman of the price committee, at the steel conference, March 20 and 21 The war board's committee has declined to take up individual complaints of manufacturers or dealers and it has been stated that the scrap men's complaint is in the taboo class.

*Commissioners Never Recognized*

While the board and the committee are not expecting to mix in the discussion which seems to be centering among the scrap dealers themselves, the government's price control division officially has never taken cognizance of the dealers' commission, one way or another. The board has not interfered with customary trade practices, it is said. As far as official action is concerned, it believes customary practices still are followed. Recognition of the fact that the institute's committee omitted the commission in its revision of scrap extras and differentials, Feb. 21, would be acceptance, or rejection, of the entire extra list promulgated by the institute. This general list, now it may be stated, is more freely accepted by the government as meeting the obligation placed on the industry by the President in his price announcement of Nov. 5.

Unless the price committee recedes from its apparent stand, it is likely the scrap men will have to wait until the next steel price conference, to be called possibly for the middle of June, before the question can be taken up with the committee. The price-fixing body wants to adhere to the plan of receiving all communications on steel through the industry's usual representatives. If the scrap men should be given an individual hearing, precedent would be established for pig iron producers, rail makers, sheet and plate manufacturers, or any other group which might want special favors.

*Would Exceed Minimum Price*

While many of the petitions which have been circulated by the scrap men to the price committee contain the names of consumers as well as dealers and brokers, many of the steel men in Washington feel as does the institute's committee, that allowance of a commission will exceed the maximum prices announced by the President. The 3½ per cent commission would about offset the $1 cut in scrap prices which became effective April 1.

## Stettinius Heads Industrial Branch of the Army

Washington, April 9.—The President last week officially answered the question of "what is to become of Stettinius" when he sent to the senate the nomination of "the surveyor general of army purchases", Edward R. Stettinius, formerly with J. P. Morgan & Co. in charge of the buying for the allies, to be second assistant secretary of war. The senate subsequently confirmed the appointment. Mr. Stettinius will be the legal head of all army matters affecting industries generally and individually.

Prior to nominating Mr. Stettinius, the President signed the bill creating the second assistant secretaryship and a third assistancy also. This latter post goes to Frederick F. Keppel, dean of Columbia University, who has been a special assistant and close adviser of Secretary Baker. The first assistant secretary, now acting secretary in the absence abroad of Mr. Baker, is Benedict R. Crowell.

Mr. Stettinius already has had a flying start for the new position for which he is named. He was called into service for the war department early in February, shortly after which it was announced he would be the "surveying eye" for Brig. Gen. Palmer E Pierce, director of purchases and supplies for all buying branches of the department. Since then his status, as far as legal authority is concerned, which seems to be a question generally raised, has been more or less doubtful. But he hasn't wasted any time. He has carefully studied the war department in all its activities and gone into every question pertaining to supplying and equipping the army.

Results of this preliminary work soon may be expected to be seen. In fact, it has been believed generally that most of the recent reorganization of the entire department has been on the suggestions made by him, by Assistant Secretary Crowell, Major General Goethals and other "progressives" who have supplanted the old school of militarists who were running the army machine as of its peace time basis. While at the capitol it is believed the insurgency of Senator Chamberlain and his senate military affairs committee is responsible for the new stride of the war department, at the lower end of Pennsylvania avenue it is declared the reorganization was "in the air" before the committee cut loose.

## Launchings to Date More Than Million Tons

Washington, April 9. — Further details regarding the present program of stimulated shipbuilding made public by the shipping board show that a total of 182 steel vessels have been launched since the inauguration of the present campaign. Of these, 170 represent requisitioned vessels of 1,173,217 tons and 12 are contract ships of 99,200 tons. Of the latter, three have been fitted out. A total of 85 requisitioned vessels have been furnished and turned over to the shipping board; and 15 requisitioned ships have been reconveyed to their former owners before completion and now are in service. More favorable weather conditions have enabled Pacific coast yards to make more speed than those along the Atlantic.

# Capital Odds and Ends

WASHINGTON, April 9.—Suit of the Atlantic, Gulf & Pacific Co. for $470,700.44, representing cost plus profit in the construction of a dry dock at Mare Island, has been denied by the court of claims. The government's counterclaim of $489.22 for excess cost of completing the dry dock upon the reletting of the plaintiff's forfeited contract to the Schofield Construction Co. was dismissed. The first company contracted in 1899 to construct the dock of timber for $729,000. The materials were changed to concrete and stone in 1900, and by agreement the price was raised to $1,125,233.83. The cofferdam gave way in 1903, this loss making it impossible to complete the dock at a profit within the contract price.

* * *

A short course in farm tractor operating will be open to women at Rutgers College, New Brunswick, N. J., if 10 applications are received.

* * *

A transfer charge of 10 cents per 100 pounds on galvanized culvert pipe at Mankato, Minn., is sought by the Chicago Great Western railroad.

* * *

S. A. Leland, representing the southwestern lines has filed an application with the interstate commerce commission to increase the loading of cars on shipments of pig iron from 50,000 tons to 56,000 tons.

* * *

The war trade board has decreed that repair parts of agricultural machinery may be shipped by mail under special export license to Japan, Italy, France and Great Britain providing they are posted by April 15.

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Presidents of railroads have been selected by Director General McAdoo as the operating heads of the railroads even where there are chairmen of boards or committee actually serving in that capacity.

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The Bronze Powder Works, Elizabeth, N. J., and the K. & E. Neumond Co., New Orleans, the majority of whose stock is owned by Germans, have been reorganized by the alien property custodian.

* * *

The Chicago, Milwaukee & St. Paul railroad requests the establishment of a charge of $7.50 per hour or fraction thereof for use of locomotive and switching crew in handling cars for loading of iron ore from stock piles, or otherwise serving iron mining companies in Wisconsin and Michigan.

* * *

More than 350,000 acres of land in southwestern Idaho, north and south of Snake river, withdrawn for classification as to coal value, have been restored by President Wilson. They were found to be noncoal in character.

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An increase of approximately 15 per cent in the carload rates on scrap iron is asked by the Raritan River railroad from points on its line to stations on the Pennsylvania, the Reading, the Erie, the Cornwall and the Central of New Jersey railroads.

* * *

F. S. Harmon & Co., Tacoma, Wash., has been awarded $103.20 excess charges on a shipment of 8600 pounds cast iron store stool bases from North Chicago to Tacoma. The railroads had charged a rate of $2.95 but the interstate commerce commission held that the rate should not exceed $1.75.

* * *

Exports in February decreased $93,000,000 from the January value, according to the bureau of foreign and domestic commerce, while imports fell $27,000,000. Exports for the eight months ending with February were valued at $3,857,000,000, as against $4,083,000,000 for the corresponding period in 1917; and imports went to $1,841,000,000, compared with $1,548,000,000 for the 1917 period.

# Foreign Ore Imports Fade

### February Receipts Drop to Remarkably Low Figure of 15,743 Tons—Other Iron and Steel Totals Small

THE extent to which the United States is relying upon its own supplies of iron ore for the production of the great tonnage of iron and steel products being furnished for war purposes, is clearly shown by the report of ore imports in February. Figures just issued by the bureau of foreign and domestic commerce show receipts for that month amounted to the remarkably small total of 15,743 tons. About two-thirds of this total came from Cuba and one-third from Spain, Canada being the only other shippet with 80 tons. February ore imports show a loss of 22,338 tons compared with the January figure of 38,081 tons, but are only about 18 per cent of the February, 1917, receipts of 86,314 tons. During the eight months ending with February, 1918, 565,258 tons of ore were shipped into this country, compared with 874,611 tons for a similar period in 1917, a loss of 309,353 tons.

| | February, | | Eight months end'g February, | |
|---|---|---|---|---|
| | 1918 | 1917 | 1918 | 1917 |
| Ferromanganese | 1,417 | 6,379 | 17,252 | 55,735 |
| Ferrosilicon .... | 238 | 572 | 4,836 | 4,647 |
| Manganese ore... | 56,289 | 39,796 | 412,418 | 428,624 |
| Tungsten bearing ore ..... | 482 | 353 | 3,386 | 2,683 |
| Nickel, nickel oxide and matte. | 3,102 | 5,038 | 37,718 | 38,965 |

IRON ORE IMPORTS, GROSS TONS

| | February, | | Eight months end'g February | |
|---|---|---|---|---|
| | 1918 | 1917 | 1918 | 1917 |
| Spain ..... | 4,663 | 23,738 | 25,459 | 140,854 |
| Sweden .... | ..... | 15,439 | 17,718 | 123,376 |
| Canada ..... | 80 | 5,687 | 141,687 | 83,952 |
| Cuba ..... | 11,000 | 33,750 | 361,957 | 466,595 |
| Oth. countries | ..... | 7,700 | 18,437 | 59,834 |
| Total ..... | 15,743 | 86,314 | 565,258 | 874,611 |

Imports of iron and steel products in the second month of the year showed a total of 12,941 tons, which is practically the same as the low record for January of 12,875 tons, but is only about half of the February, 1917, figure of 24,947 tons. Both scrap and pig iron imports show an increase in February over January, but are considerably below the February, 1917,

IRON AND STEEL IMPORTS, GROSS TONS

| | February, | | Eight months ending Feb., | |
|---|---|---|---|---|
| | 1918 | 1917 | 1918 | 1917 |
| Scrap ..... | 4,934 | 15,943 | 51,725 | 130,374 |
| Pig iron..... | 3,435 | 7,237 | 38,066 | 91,269 |
| Steel ingots, bl'ms and billets..... | 2,672 | 706 | 34,152 | 13,042 |
| Wire rods..... | 271 | ..... | 1,435 | 2,063 |
| Rails ..... | 33 | 240 | 6.376 | 10,836 |
| Bar iron..... | 400 | 95 | 2,110 | 3,990 |
| Structural ..... | 117 | 12 | 6,658 | 676 |
| Sh. and plates... | 610 | 111 | 1,627 | 1,205 |
| Tin and terne plate ..... | 32 | 35 | 32 | 553 |
| Tin scrap..... | 437 | 568 | 5,643 | 5,322 |
| Total ..... | 12,941 | 24,947 | 147,824 | 259,330 |

tonnage. The pig iron imports for February amounted to 3435 tons, an increase of 1943 tons compared with January, when only 1492 tons were received in this country. Steel ingots, billets and blooms for February fell off to 2672 tons, compared with 4847 tons in the previous month. This is, however, a considerable increase over February a year ago, with only 706 tons. The tonnage of other products imported is so small as to be almost negligible.

# Better Output

**Shown in Refractories and More New Business Being Accepted**

Orders are being booked by makers of refractories in fair volume for first and second quality fire clay brick. The latter, because of the greater tonnage required, is in heaviest demand, largely from operators of blast and open-hearth furnaces. New brick-making capacity having been put into operation, producers are in a better shape to take care of inquiries and to make more satisfactory shipments, a considerable portion of which is for second quarter delivery. Shortage of coal and of lime is interfering with output, but improved car supplies are expected to develop and to allow greater operations. The latter now are estimated at about 60 per cent of capacity.

## Refractories

(Per 1000 f. o. b. works)

**FIRE CLAY BRICK.**

(First Quality)

| | |
|---|---|
| Pennsylvania | $45.00 to 55.00 |
| Missouri-Illinois | 55.00 to 65.00 |
| Ohio | 45.00 to 50.00 |
| Kentucky | 45.00 to 55.00 |
| New England | 55.00 to 65.00 |

**FIRE CLAY BRICK**

(Second Quality)

| | |
|---|---|
| Pennsylvania | $40.00 to 50.00 |
| Ohio | 35.00 |
| New England | 48.00 to 58.00 |

**SILICA BRICK.**

| | |
|---|---|
| Pennsylvania | $50.00 to 60.00 |
| Chicago | 55.50 to 65.50 |
| Birmingham | 45.00 to 55.00 |

**MAGNESIA BRICK**

(Per Net Ton)

| | |
|---|---|
| 9 x 4½ x 2½ | $135.00 to 160.00 |

**CHROME BRICK**

(Per Net Ton)

| | |
|---|---|
| 9 x 4½ x 2½ | $135.00 to 140.00 |

**BAUXITE BRICK**

(Per Net Ton)

| | |
|---|---|
| 55 per cent | $40.00 base |
| 76 per cent | 100.00 base |

Prices remain unchanged, and so far as known, no revision is being contemplated. Makers say, however, that if a change were made, it would call for higher levels, and they are showing no concern about the government regulating their prices. As a matter of fact, it is reported that, when there was considerable talk about this being done, the refractories interests invited the government to make any investigation regarding their costs and prices, feeling confident that at least no reductions would be made. No change has been made in prices since the war broke out.

A serious condition exists in the refractories industry. Cars are not forthcoming to provide transportation for materials in which the blast furnaces and open hearths stand in imperative need. One producer summarizes the situation existing in his plant by citing the fact that for the past few weeks less than one-sixth of the cars asked for have been placed, and his plant has over three months output stacked and awaiting transportation. An embargo on box cars through the east has had its influence. Even open cars are wanting. The orders of steel companies having urgent government business seem to have no weight in securing cars for the delivery of needed refractories. The occasional intervention of someone with authority in the production department of the government secures relief for only one consumer and often leaves standing on the books of the refractories producer, orders which have already waited months for delivery.

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Until federal officials can arrive to arrange for an adjustment, the Pittsfield, Mass., employes of the General Electric Co., have voted against a strike and to stay at work.

# Obituaries

HENRY M. ATWOOD, aged 80, a prominent foundryman, died Saturday, April 6, at his home in Leetsdale, Pa. Before retiring from active business three years ago, Mr. Atwood was chairman of the board of directors and president of the Pittsburgh Valve, Foundry & Construction Co., which was organized in 1900. He was formerly a member of the firm of Atwood & McCaffrey, which along with other companies was absorbed into the Pittsburgh Valve, Foundry & Construction Co., and he became its first president. Mr. Atwood was born in Pittsburgh, the son of Moses Atwood, and moved to Leetsdale when he retired.

Archibald K. Baxter, president of the Baxter Gear Cutting & Mfg. Co., Cleveland, died in that city April 5, aged 41.

William J. Boland, Chicago, manufacturer of machinery, died April 3, following an attack of pneumonia. He was born in Ottawa, Can., 59 years ago and moved to Chicago in 1881.

J. R. Van Ormer, who for the past 18 years has been general sales agent of the Lukens Steel Co., Coatesville, Pa., died March 27, following a lingering illness of about seven years. He jointed the Lukens organization over 22 years ago.

Robert Perkins, who retired two years ago from the Massnick Phipps Mfg. Co., Detroit, auto parts, in which he owned the controlling interest, died recently at his home in Cleveland. He was born in Woolwich, Eng., in 1859, located in New Britain, Conn., as a young man and entered the automobile business with the Corbin Motor Vehicle Co. Later he moved to Detroit and became factory manager of the Gemmer Mfg. Co., steering gears and transmissions, resigning to purchase the Massnick-Phipps Mfg. Co.

Sidney A. Grant, inventor of envelope machines and attachments on chainless bicycles, died in Thompsonville, Conn., recently. He was born in Ovid, N. Y., 75 years ago but spent most of his life in Connecticut. He was one of the first to introduce the chainless bicycle on the market.

Frederick Ayer who with J. M. Longyear, Marquette, Mich., disposed of their coal and mineral interests in Spitzbergen to Norwegian capitalists at the outbreak of the war, died recently in Washington, aged 96. With Mr. Longyear, Mr. Ayer was identified with many iron ore and copper mining, timberland and other commercial operations in upper Michigan.

John F. Wilcox, prominent mechanical and consulting engineer of Pittsburgh, who was one of the country's pioneers in the development of the by-product process of coking coal, died recently at Tryon, N. C., where he had made his home for the past 10 years in an unsuccessful effort to regain his health. After he was graduated from Worcester and Philadelphia Polytechnic institutes, he entered the mechanical engineering profession in Pittsburgh and for many years specialized as a consulting engineer on blast furnace and steel construction. Mr. Wilcox erected the Otto-Hoffmann type of by-product plants at Glassport and Johnstown, Pa., Boston and Sydney, N. S., as well as at many other points through Fayette and Westmoreland counties, Pennsylvania.

# Aircraft Work Grossly Mismanaged

—Aeronautical Society Committee

## Report of Investigating Committee of Aeronautical Society of America Makes Sweeping Charges of Incompetency, Carelessness and Failure to Use Country's Productive Capacity or Specialized Skill in Airplane Program

DETAILS of disastrous delays which are preventing the fulfilment of the government's aircraft program, condemnation of the alleged shiftless direction of its execution and charges that false statements have been issued by government authorities regarding progress in airplane construction, are embodied in an extensive report of an investigating committee of the Aeronautical Society of America, Inc., just made public. The report of the investigating committee, which is composed of Leon Cammen, Thomas A. Hill and Charles W. Howell, allegates that not only is the present execution of the airplane program characterized by gross mistakes and misdirection which are bound to prevent effective results but the officials in charge of the work absolutely refuse the co-operation of experienced aeronautical engineers whose aid is essential. The report characterizes the present direction of the aircraft program as incompetent and demands that in the public interest changes in personnel be made without delay. In issuing the report, the society states that to maintain silence would be treasonable.

The most serious charges contained in the report are those which designate certain official statements of the government as untrue. A statement by Secretary Baker, in an official bulletin of Sept. 13, 1917, that "The United States aviation engine has passed its final tests" is characterized as unqualifiably untrue, since the statement which was made by Major J. C. Vincent in December, 1917, shows that the only test given to the engine at the time referred to by Secretary Baker was a 50-hour test, not at maximum horsepower. In fact, the report states it is doubtful that the engine even now has received the final test. Secretary Baker's statement also asserted that "tools for building the first engine were made even before the drawings were finished on the assumption that they would be correct." "It is absolutely impossible that this could be true," the report states, "as before the tools can be made, the dimensions of the parts have to be known." After alluding to several other misstatements by Secretary Baker, the report declares his assertion in October, 1917, that "work is in progress on practically the entire number of aeroplanes and motors, for which provision was made in the aviation bill passed by congress in July," as an inaccuracy of a still graver character, as at that time practically no work was in progress on the manufacture of machines, and in many cases the buildings in which the machines were to be manufactured were not yet built.

### *Only Two Planes Shipped*

The report quotes as misleading Secretary Baker's announcement in February, 1918, which stated that the first American battleplanes were enroute to the front in France; it is pointed out that, as a matter of fact, only two planes then were shipped. At that time Secretary Baker stated that "these planes are equipped with the first Liberty motor from machine production; one of them in a recent test surpassed all records for speed and climbing for planes of that type." In view of the fact that several weeks after the shipment of these planes, the report states, such a vital piece of construction as the lubricating system of the Liberty motor has been found to be unsatisfactory, the talk about breaking a record sounds discouraging.

"According to Reuter's agency," states the report, "the French general staff has in its possession proofs that the Germans, spurred to greater effort by the fear of American achievement, have vastly increased their aerial forces. Some 400 furniture, woodworking and piano factories have been converted to new uses; the Fokker company has taken over the great Berzina piano factory, near Schwerin, and large orders for parts have been placed in Switzerland. The production in Germany has reached 700 to 1000 planes a week, and is growing. The American danger also has been referred to on several occasions in German general staff orders. This would have been bad enough if the American planes were there," states the report, "but they are not."

The censorship which has been exercised over all matters connected with the execution of the aircraft program, not only has been unreasonably rigorous, it is declared, but in the majority of cases it has no military value whatsoever and at the same time materially interferes with production. The original statement about the Liberty motor was issued in September, 1917, but nobody was allowed to know any details of construction. About six weeks later a brief notice in *Power* gave a few details about this construction, enough to recognize the type but not enough to be of any other use. In the early part of December, Major J. G. Vincent presented a paper before the society of automotive engineers, which gave sufficient data for the enemy to recognize the vital features of the design of the engine, but not enough for American engineers to be of service to the government. Since then, little items of information have filtered through, indicative mainly of various teething troubles in the growth of the motor. If an American engineer were to go to the signal corps and ask to see the motor so as to offer his suggestions, the report intimates, he probably "would be thrown out of the room." "The result of this policy has been quite disastrous," the report continues. "The tooling up of the motor has been delayed, because the designers of the motor were not machine shop men. Several troubles, such as ignition in the high-altitude type, cooling and lubrication, could have been avoided if advice had been early sought or welcomed. The Liberty motor contains, even now, features which would not stand the open criticism of American engineers but this criticism is stifled by the fact that nobody but those who can be 'politically trusted' are permitted to see the motor."

Unsparing condemnation of the methods which have permitted the numerous accidents to aviators in training, is embodied in the report. These accidents are assigned to careless supervision and

### What Report Charges

*Untruthful statements regarding progress of program by Secretary of War Baker.*

*Stifling of criticism of present Liberty motor.*

*Careless supervision in training methods leading to many accidents.*

*Ignorance of the recruiting requirements for the airplane service.*

*Retardation of research and invention by methods pursued.*

*Failure to utilize the country's full productive capacity.*

it is stated that if some of the accidents which have taken place at training camps lately had happened at flying schools in civil life, the men in charge would have been indicted for homicide. The report details the various types of accidents, and the methods of preventing them.

The signal corps is quoted as offering the statement that "there is no lack of human aviation material, no matter if fit boys do go to other arms of war service," in explanation of the fact that recruiting for men for the flying service has been entirely discontinued. This is a plain case of careless ignorance of the problem before us, the report states, which shows that the men in charge of American aviation have failed to learn from European experience.

"The best flying material is furnished by young men between 21 and 25," it is stated. "The June, 1917, registration showed approximately 10,500,000 men of the ages between 21 and 31. Hence, roughly, 4,500,000 men would fall within the limits 21 and 25. Of these 4,500,000, roughly 25 per cent have to be eliminated as covering aliens and colored men, who could not be considered for the service. This leaves 3,375,000 men. As about one man in 100 makes really good material for the aircraft service flying branch, this would indicate that we have roughly about 40,000 men available. Perhaps 10,000 more could be secured by lowering the age limit to 19 years, which would be advisable anyhow. Still, going by averages, we have only 50,000 men. Of course this is more than sufficient for the number of planes which the present aircraft administration can produce, but it is entirely insufficient for the number which this country may need if the war is carried into 1919.

"It is by no means exaggerated to expect that between 75,000 and 80,000 machines with the American star may have to be delivered to the European front by the middle of 1919, if we want to smash the Hun. If 75,000 or 80,000 machines have to be delivered, that will mean 150,000 men, which again will mean that even a country with the best human resources in the world practically untouched, may have to strain its resources to the utmost and perhaps use the second best material to meet the most urgent situation that human history has seen.

"We can train our men," states the report, "so as to produce at least 300 per cent better men than either England or France have been able to produce, and we are not doing it, exclusively because everybody seems to think that we must copy every mistake and every defect of the foreign systems. Americans have never been so lavishly subservient to foreign examples. There seems to be some kind of a fog around the whole aviation program which precludes the men in charge from seeing either the great resources, human or material, of our country, or the ultimate aim of our program, and our boys will pay for this with their lives.

"The art of aviation is tremendously new," says the report, "and the efficiency of the engine, plane and accessories is comparatively low. In fact, it would not be an exaggeration to say that the efficiency of the aeroplane as a whole is hardly more than 3 per cent. It is because of these facts, that research and invention play an unusually important part in the development of aeronautics. The aeroplane is an American invention and America has the best machine shop men, the best makers of automatic machinery, and the biggest makers of automobile engines, so that when we entered into the struggle, the world had a right to expect that a new era had begun for aeronautical development. The matter of invention and research is of far greater importance than mere sentiment or advertising. One thousand bigger and better machines than any now available at the front, would be far more valuable than 5000 machines of the usual size and capacity and than 10,000 machines of inferior speed or carrying ability."

### *Need Research Facilities*

The report reviews the present facilities for research and invention, stating that they are woefully inadequate, and that it is essential to reorganize the national advisory committee for aeronautics, provide ample laboratory facilities and a staff of men, and an appropriation of something like $25,000,000, instead of the $260,000 which now is being asked by the committee for next year.

"Probably not more than 5 per cent of the productive capacity of the country is being utilized for manufacturing airplanes, because apparently the ability to produce goods urgently needed, is by no means a sufficient consideration for securing a contract. It is found," states the report, "that in some cases, a broker's commission must be paid to a favored company by those who desire to get work.

"Thus, there have been before the United States entered into the war, several small aeroplane companies who have been doing very fine work on a small scale. When the United States entered the war these companies offered their facilities to the government. Cases are known," states the report, "where such companies were told that they could work only as sub-contractors to the Curtiss Aeroplane & Motor Corp., and when they went to the Curtiss company, they were told that they could secure such contracts only by paying the Curtiss company a commission somewhat in excess of 1 per cent, and further by recognizing the validity of the Curtiss patents, some of which now are under litigation and some others not considered as valid by American builders. Howard E. Coffin was asked by the directors of the Aeronautical society to explain why a company could make planes as a subcontractor to the Curtiss company, but not as a direct contractor to the United States government. Mr. Coffin startled the directors of the society by declaring that he was entirely ignorant of the existence of such a situation.

"That there have been great delays in production has been vigorously denied about three weeks ago," states the report, "and in fact there was a tendency to brand as pro-German propaganda all assertions that there have been delays. Of late, however, the pitiless logic of facts forced the war department to concede a delay at the rate of about 60 to 90 days, resulting in the fact that instead of thousands of planes being delivered to France by July 1, only the pitifully ridiculous number of 37 planes might be so delivered, sufficient for about six hours of fighting at the present rate." The report sets forth in detail the causes of the delay. It concludes with a statement that something like 75,000 and perhaps 100,000 aeroplanes may be expected of this country by April, 1919, and that in order to achieve this end changes both in the personnel and in the methods of the aircraft board are imperative.

On the subject of the Liberty motor, the report says: "The true story of the Liberty motor is one of which the country may well be proud." It points out, however, that the effect of fanciful, untrue and boastful statements employed in the publicity campaign of the aircraft officialdom, has been to create considerable uneasiness and suspicion regarding the motor in the minds of the people. It relates how the Packard Co., long before the country went to war, foresaw the emergency and spent on its own volition a large sum of money and two years of valuable experimentation in the development of an airplane engine which has formed the basis for the Liberty motor. "The Liberty motor represents in the first place the result of these two years of experiment, and further, the additional work put into it by a number of engineers, who though not specialists in aeronautical motors have done in the past splendid work in the production of the high speed gasoline engine. The motor is therefore without doubt an excellent motor but it is not the best motor that the country could have produced and it is not yet the motor which it is safe to use on the front."

# How Lake Trade Will Be Handled

### Details of Plan for Co-ordinating Movement of Iron Ore and Coal With Supply and Distribution of Transportation Facilities—Speakers at Meeting Urge Relief for the Railroads

DETAILS of the plan for mobilizing lake trade are being worked out. Most of the committees charged with the responsibility of directing lake trade have been chosen and are at work perfecting their organizations. Favorable ice reports lead to the hope that navigation on the Great Lakes will open earlier this year. Every effort is being made not only to have the boats ready to go into commission promptly but also to have the directing committees prepared to take up their tasks from the start.

The plan for handling the ore and coal trades through a closer co-ordination with the transportation agencies is shown graphically in the accompanying illustration. The plan was approved at meetings held last week by the different interests concerned. The newly organized ore and coal exchange will co-ordinate lake trade through the assistance of an administration committee composed of one representative from each of the four interests. Each of these interests in turn will have a major committee responsible to the American Iron and Steel institute, the shipping board, the fuel administration and the regional director of railroads, respectively. Each interest also will have an operating committee to handle properly the details of the ore and coal movement and the vessel and car supply.

At the meeting held last week by the shippers and consumers of Lake Superior ore, the co-operation of every firm was requested by the speakers and was unanimously granted by all the companies represented. H. G. Dalton of Pickands, Mather & Co., presided as chairman. Abstracts from his address and from that of Harry Coulby, president, Pittsburgh Steamship Co., are presented below. Railroad conditions are the crux of the whole situation and the speakers all emphasized the point brought out by Matthew Andrews of M. A. Hanna & Co., that "we have ample boats and the whole game is to avoid overloading the railroad machine."

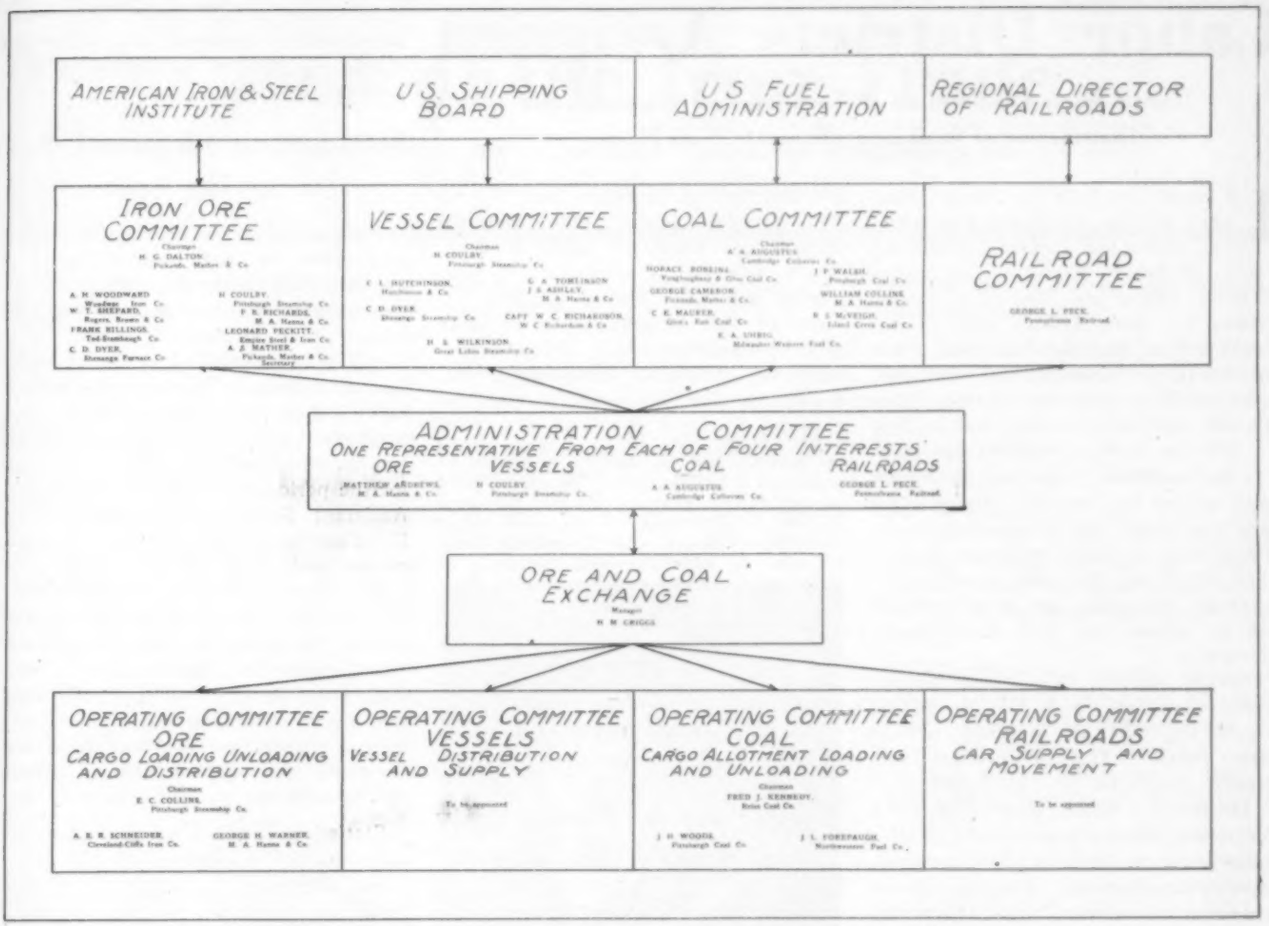
# Importance of Conserving Transportation

BY HARRY COULBY

We all know that the weak link in our chain over here is our railroad transportation and our man power. We also all know that this is a war of steel and that it is vital that the great iron and steel industries should be kept going to the full limit of their capacity. We had experience last year in trying to work out co-ordination and co-operation between those industries, and the sum total of it is, notwithstanding it may have taken a little skin off in places, inconvenienced some people, and the methods may have seemed a little rough, the sum total of it was that here, on this second day of April, we are able to say that we moved all the ore that was needed, all the coal that was needed, all the grain that they could give to us up to the close of November. So while our methods may have been rough and crude, the result was fairly satisfactory.

Now, the men who are charged with the responsibility of this water and rail transportation, believe, in the light of their experience of last year, that we can do better the coming year than we did in the past. The past season illustrated our shortcomings and the places where we could show improvement. The basic principle, of course, of co-ordination and co-operation, must be absolute fairness. Everybody connected with the allied industries—ore, vessel, coal and railroad—and the committees that have been formed in these several industries will have to regard themselves as your servants and trustees for you, whether your interest is small or great, and will have to guard your interest jealously to see that every man gets fair treatment.

Each and every company is going to be a user and buyer of railroad transportation. It is a patriotic duty not to ask for or use a car of transportation during the season of 1918 that you don't absolutely need to carry you over until the season of 1919. I know how impossible it is at this time for any consumer of iron ore in this room to state definitely just how much ore he will consume between now and June 1, 1919, but if he will go at it from a patriotic standpoint, if he will realize that there is a vital thing in which he can be most helpful in helping out this nation in conserving railroad transportation, if he will sit down by himself and of himself, regardless of whether he thinks or is told that some other fellow is hogging it, and say, "Now, they are all going at this thing in the spirit of co-ordination, and they are my trustees, they represent me, and I am only going to ask those men and the railroads of this country to take care of me to the extent of my actual requirements," and refusing them, as you may find, they will have to as the season goes on, in accord with your consumption of ore, if every man in this room will make up his mind that so far as he is personally concerned he will do that, that he will give all these committees such information that they require about his ore movement, which rests entirely upon the rail transportation, if he will realize that we are only asking for that information because it will enable these committees to help him and the general industry of the country, if he will approach it from that standpoint and come across and do his duty in conserving the railroad transportation, my own belief is that with the railroads all centralized under one management, with the flexibility that comes in the routing and distribution of cars, if he will feel that whenever he is




HOW DELAYS IN MOVING LAKE FREIGHT ARE TO BE CUT DOWN

delaying the unloading of iron ore when he could unload it faster, that it is up to him to correct that, I feel satisfied myself that we can take care of every requirement of the furnaces, and of the coal men, and we can conserve the labor, which is essential. And if every man in this room will catch the spirit of it and will come across, when we get through at the end of the year you are all going to be satisfied, and you are all going to have all you ought to have, which is enough to carry you through until the spring of 1919.

# Why a Plan of Co-operation is Needed

BY H. G. DALTON

We were rather successful last year in trying to mobilize and co-operate iron ore shipping as connected with the movement on the lakes, and we believe that we can profit by experience and have a better arrangement this year. We are going to try as far as possible not to interfere with any concern's business or any man's way of running his business. Necessarily, in times like these, where coordination is necessary, some questions have to be asked in order that the committees may intelligently perform their work, and some statistics will be required. They are going to be as few and far between as we can get along with.

The plan aims in its essential points, of course, to deal as lightly with the railroads as we can.

From the information supplied on the statistical blanks we are sending out, we are going to make a start and see if we can regulate the shipments so that these congestions of boats that we had last year will be avoided. The matter of large accumulations of ore in the upper lake parts, interfering with the operations of the mines, will be avoided. The embargoes in the lower lake districts, and the condition where one plant has more ore than it can work and another plant is idle—all those things we are going to try to regulate so that each concern will get its fair share of the facilities, continuously.

I want to emphasize again that this is a question of dealing lightly with the railroads. I think the government above all things wants you to be sure that you have your ample supply of ore, with proper mixtures to carry out your business. But they don't want you to have more than you need. So in estimating your requirements up to June 1, 1919, don't try to ask for more than you need, don't want and try to get it down faster than it can come regularly, or than the railroads can handle it and furnish cars for it. Don't try to get your ore any quicker than somebody else gets his ore. Be satisfied to work with us to try to give everybody his proportionate amount as we go along.

# Labor Districts Assigned

**United States Divided Into 13 Territories for Clearance and Distribution of Workmen—Several Chiefs Named**

IN order to facilitate labor clearance and the distribution of workers under the auspices of the dement of labor, Secretary of Labor Wilson announces that the United States has been divided into 13 districts. This division has been made according to homogeneity of industries and employment problems. Each district will have a chief, whose duty it will be to not only keep track of the available labor supply in his district but to receive requests for workers from the employers in it. From data in hand, workmen will be distributed to the best possible advantage, and plans are being perfected in connection with their transportation.

Several district chiefs have already been appointed and the remaining territories will be assigned in the near future. The 13 districts with chiefs appointed to date, are:

District 1.—Maine, New Hampshire, Vermont, Massachusetts and Rhode Island, H. A. Stevens, district superintendent, Boston.

District 2.—New York, Connecticut and New Jersey.

District 3.—Pennsylvania and Delaware.

District 4.—Ohio and West Virginia.

District 5.—Maryland, Virginia, North Carolina and South Carolina, Ralph I. Izard, district superintendent, Richmond, Va.

District 6.—Georgia, Florida, Alabama, Mississippi and Louisiana.

District 7.—Indiana, Illinois, Michigan, Wisconsin and Iowa, Dr. P. L. Prentis, district superintendent, Chicago.

District 8.—Kentucky, Tennessee, Missouri and Arkansas.

District 9.—Minnesota, North Dakota, South Dakota and Montana.

District 10.—Nebraska, Kansas, Oklahoma, Colorado and Wyoming.

District 11.—Texas and New Mexico.

District 12.—Arizona, Utah, Nevada and California, William T. Boyce, district superintendent, San Francisco.

District 13.—Washington, Oregon and Idaho, Henry White, district superintendent, Seattle.

## Thanks Labor Board

President Wilson has sent a note of thanks to each of the 12 members of the war labor conference board, comprising five representatives of employers, five of employes and two of the general public, who recently signed and presented what is practically a code of conduct for both capital and labor during the war. A copy of the congratulatory message sent ex-President Taft, public representative chosen by employers, follows:

My Dear Mr. Taft: I have been so much and so deeply gratified, in common I believe with the great body of our fellow citizens, by the outcome of the conferences of the war labor conference board that I cannot deny myself the privilege and pleasure of writing you at least a line to say how highly serviceable I believe the result attained will be to the country and how fine an example it is of the spirit of co-operation and concession which is drawing our people together in this time of supreme crisis.

Cordially and sincerely yours,

WOODROW WILSON.

## Wants Each Community to Handle Housing

To correct a misapprehension concerning the government's intentions relating to the housing problem in industrial centers, Otto M. Eidlitz, director of housing and transportation, of the department of labor says it is the duty of each community to solve its own difficulty. "It is," he states, "a matter of much concern to all governmental departments that various districts are getting a wrong idea as to the government's intention in relieving the housing shortage. Communities should realize that due to the high cost of building materials, housing has been inadequate to meet even a normal growth and war work has accentuated this situation."

With reference to ways and means to solve the problem, Mr. Eidlitz recommends that those who have not done so be urged to take in boarders during the emergency and houses or institutions that could be converted into rooming houses for large numbers. He suggests that every possible method be followed and only as a last resort should new houses be erected, since the demand for government aid is greatly in excess of the funds available. "For workers who are induced to come from outlying districts," he states, "transportation facilities should be increased and improved." He calls attention to the fact that if war business is bringing large sums to a locality, it is not unreasonable to expect that a portion should be devoted to increasing that locality's housing.

## Will Adjust Shipyard Pay to Living Costs

That shipping yard wages will keep pace with the high cost of living is the intention of representatives of the department of labor and the United States shipping board. Recent conferences have resulted in the recently issued statement that if satisfactory figures showing the exact living cost in shipbuilding centers, can be worked out, an effort will be made to arrange for the periodical adjustment of wages. Assistant Secretary of Labor Louis F. Post recently stated: "Unless wages and food prices which have been racing each other with the latter in the lead, can be equalized, the worker is going to receive smaller real wages no matter how much money he gets. The cost of living has been advancing at least 2 per cent a month and the man receiving the same wages as he received a year ago is only three-fourths as well off."

Statistics gathered by the labor department of conditions in the New York shipbuilding district show that from the beginning of the war until December, 1917, men's clothing had advanced 51.4, women's clothing 51.63, furniture and furnishing 56.47, food 55, housing 2.6, fuel and light 19.92 and miscellaneous items 44.68 per cent.

## Lose Foundry Labor

Philadelphia, foundrymen are worrying over the extent to which the demands of the various shipyards in that district are taking their molders, coremakers and laborers away from them. Many of the foundries most seriously effected are working on urgent government contracts for castings. Owing to the loss of men who have gone to work in the shipyards lately, the output of these foundries is badly crippled. This subject was discussed at length at the meeting of the Philadelphia Foundrymen's association, April 3, and methods to cope with this difficulty were suggested and will be worked out. The meeting was addressed by H. A. Plusch, chemist for the Abrasive Co., of Philadelphia. Mr. Plusch spoke at length on the subject of abrasives, and particularly on the use of manufactured abrasives in the manufacture of the vital necessities of modern warfare. The Lansdale Foundry Co., Lansdale, Pa., of which H. I. Landis is president, has been proposed for membership.

# Men of the Iron Trade

**Personal News of a Business Character Regarding the Men of Affairs of the Industry**

GEORGE L. DANFORTH JR., who has been appointed assistant general superintendent of the south works of the Illinois Steel Co., to succeed Herman A. Brassert, resigned, was born in Louisville, Ky., Nov. 8, 1879. After leaving school, he started to work in the open-hearth department of the Birmingham Rolling Mill Co., Birmingham, Ala., where a few years later he was made melter foreman. He was next employed in the open-hearth department of the Tennessee Coal, Iron & Railroad Co., at Ensley, Ala. In 1900 he entered the service of the Illinois Steel Co., at South Chicago, in the open-hearth furnace department. He has been with the Illinois Steel Co. ever since, with the exception of a short period, as furnaceman, melter foreman, superintendent of open hearths, superintendent of steel production and now as assistant general superintendent. On account of his early connection with the open-hearth department, and a natural ability and aptitude for his chosen work, Mr. Danforth became thoroughly proficient with this branch of the steel industry. He long has been considered one of the leading authorities in the manufacture of open-hearth steel. He is the originator of many important improvements in open-hearth practice and in open-hearth furnace construction.

J. W. Barber on April 1 became vice president of the Manown Mfg. Co., Pittsburgh, brick, fire clay, cupola linings, etc., succeeding C. H. Van Dyke, resigned.

A. E. Ostrander has been promoted from the position of mechanical engineer to that of general mechanical engineer of the New York office of the American Car & Foundry Co.

W. O. Duntley has resigned as president of the Chicago Pneumatic Tool Co., Chicago, in order to take a rest and then give more attention to his other business interests.

W. D. Bunker, former manager of the Judson Mfg. Co., San Francisco, was recently elected vice president and general manager to succeed A. D. Shepard, resigned.

C. S. Cleland on April 10, addressed the New England Foundrymen's association at Boston on the subject of core binders. He is sales manager of the Black Products Co., New York.

Wallace H. Rowe, president of the Pittsburgh Steel Co., who has been seriously ill, since the fall of 1917, is now well along the road to recovery. He is able to see his friends and enjoy automobile outings.

William A. Ragan, formerly special sales agent of the U. S. Reduction Co., has been appointed Indiana and western Ohio sales representative of the United Smelting & Aluminum Co., Inc., New Haven, Conn.

GEORGE L. DANFORTH JR.

Irving C. Berroyman has been made general superintendent of the Cleveland Worm Gear Co., Cleveland. He was for a number of years efficiency engineer for the Packard Motor Car Co., Detroit.

Thomas Crabtree, who has served as treasurer and superintendent of the Majestic Mfg. Co., Worcester, Mass., bicycle specialties, for a number of years, has become treasurer of the National Plating Co., Worcester, metal plater.

H. C. Dodge has been elected chairman of the board of the Laconia Car Co., Laconia, N. H. C. A. Towle is now vice president and general manager and W. A. Kilvert was made assistant treasurer.

W. Maxwell Reed, Framingham, Mass., has been made plant manager of the American Wringer Co., Woonsocket, R. I., a newly created position. He was formerly affiliated with John A. Roebling's Sons Co., Trenton, N. J.

H. F. Roberts affiliated for 10 years with the E. L. Essley Machinery Co., Chicago, recently as secretary now is connected with the sales force of the Marshall & Huschart Machinery Co., in that city.

F. W. Olsen was recently appointed general purchasing agent for all plants of the United States Radiator Corp., to succeed the late B. F. Rennison. The company's general offices are at Detroit, which will be Mr. Olsen's headquarters.

K. B. MacDonald, who formerly was vice president and director of the Curtiss Aeroplane & Motor Corp., Buffalo, has received a commission as lieutenant commander in charge of naval aircraft manufacture at League Island shipyard.

E. G. Howell, for 13 years associated with the Chicago sales office of the Republic Iron & Steel Co., has become associated with Briggs & Turivas, Inc., Westminster building, Chicago, dealers in iron and steel scrap.

James M. Smith is in charge of the shipbuilding plant of the Canadian Car & Foundry Co., at Fort William, Ont. The plant has a contract to turn out 12 trawlers for the French government before the end of the 1918 season, and is almost ready for operation.

J. A. Moore, who for two years has been foundry superintendent of the Russell Wheel & Foundry Co., Detroit, returned to the employ of the American Blower Co., Detroit, upon his recent resignation, resuming his duties as superintendent of the foundry.

Harry Fitch, who for a number of years has been associated with the John H. Fitch Co., Youngstown, O., wholesale grocer, resigned recently to accept an important position with the Liberty Steel Co., Warren, O. He will assume his new duties about July 1.

Theron L. Loose, who for five years has been superintendent of the Hendee Mfg. Co., Springfield,

Mass., motorcycles, resigned recently and has made no announcement as to further plans. His successor has not been named.

Fred H. Cozzens was recently made general sales manager of the Topp-Stewart Tractor Co., Clintonville, Wis., which expects to be manufacturing farm tractors on a large scale by May 1. Mr. Cozzens was formerly export sales manager of the Four Wheel Drive Auto Co., of that city.

Julius Nahoum, who resigned as managing director of the Vulcan Trading Corp. recently, has accepted the management of the Bi-Continent Trading Corp., 50 Broad street, New York City. The latter has enlarged its facilities for acting as an agent or principal in import and export business.

Charles Kramer, formerly chief clerk at the Carnegie Steel Co.'s warehouse at Waverly, N. J., has been promoted to the superintendency to succeed E. A. Amaden, who some time ago was appointed general superintendent of warehouses for the Carnegie company. J. H. Fogwell succeeds Mr. Kramer as chief clerk.

H. D. Mortenson is president of the reorganized Grants Pass Iron & Steel Works, recently incorporated under the name of the Klamath Iron & Steel Works. The former company has moved from Grants Pass, Oreg., to Klamath Falls, Oreg. J. W. Fitzpatrick is secretary and treasurer; B. M. Hall is general manager.

Howard J. Griffin, who for the past year has been Chicago district manager of the Milwaukee Electric Crane & Mfg. Co., Milwaukee, has been made Pittsburgh district manager, effective May 1. Prior to joining the Milwaukee Electric Crane organization, he was affiliated with the Allis-Chalmers Mfg. Co., for about 15 years.

William H. Barr, president of the Lumen Bearing Co., Buffalo, and president of the National Founders' association, and H. H. Rice, Detroit, past president of the National Metal Trades association, were speakers at the annual meeting and banquet of the New Haven, Conn., branch of the latter organization, April 3.

James A. Galligan has been appointed coke administrator for the Chicago district by the fuel administration and will have charge of the apportionment and distribution of coke. He is affiliated with the by-product coke industry in an important way with Pickands, Brown & Co., and the By-Products Coke Corp. Similar duties in the Detroit territory have been assigned to James A. Ballard.

T. E. Agnew has been appointed assistant superintendent of blast furnaces of the McKinney Steel Co., Cleveland, taking the place vacated by George O. Hollenbaugh, who became superintendent when Charles E. Ash resigned. Mr. Ash was recently made superintendent of blast furnaces of the Taylor-Wharton Steel Co., Wharton,

Charles R. Putnam has been transferred to the Cleveland district works of the American Steel & Wire Co. For the past two years he has been superintendent of the north works of the company at Worcester, Mass., prior to which he was located at Waukegan, Ill., going there from Cleveland. J. Lester Perry, superintendent of the south works, Worcester, succeeds Mr. Putnam as superintendent of the north works.

H. B. May, who for the past year has been efficiency engineer with the Youngstown Sheet & Tube Co., Youngstown, O., enlisted recently in the aviation corps and has reported at Washington for assignment. After being graduated with the 1913 class in mechanical engineering from the Louisiana State Institute, he was affiliated with the American Steel Foundry at its Alliance, Franklin and Welland, Can., plants before locating in Youngstown.

William E. Hoblitzell, who formerly was affiliated with the American Steel Foundries and more latterly with the Commonwealth Steel Co., Granite City, Ill., as general manager, has been appointed general manager of the Duquesne Steel Foundry Co., Coraopolis, Pa., to succeed R. A. Bull. Mr. Bull who recently received a captain's commission in the ordnance bureau of the war department, has left the services of the Duquesne Steel Foundry Co., temporarily.

Allan C. Davidson, who has been cost accountant in the pressed steel department of the Sharon Steel Hoop Co., and more recently in the auditor's office at Sharon, Pa., has been named chief clerk of the Mahoning division of the Steel Hoop company at Youngstown to succeed Walter E. Brown, who retired recently to manage the Jersey farm owned by Jonathan Warner, president of the Trumbull Steel Co. Mr. Brown was presented with a diamond pin by his associates.

Leon O. Hart, who has been assistant treasurer of the Driver-Harris Wire Co., Harrison, N. J., since March, 1917, prior to which time, he served as electrical engineer, was made treasurer at the company's recent annual meeting. He was born in Hoboken, N. J., in 1885, and was graduated from the Stevens institute of technology with the class of 1907 with the degree of mechanical engineer. After his graduation he worked as cadet engineer with the Public Service Gas Co., of New Jersey for about a year and then joined the Driver-Harris forces.

E. A. Taylor succeeds C. W. Adams as general production superintendent of all plants of the Maxwell Motors Co., that latter being appointed general factory manager. Mr. Taylor formerly was general superintendent of the company's Dayton plant but latterly occupied the same position at the Chalmers plant of the Maxwell company in Detroit. Myron Holzapple, Mr. Taylor's assistant at Detroit, has been made general superintendent of the Chalmers plant.

John A. Oartel, who for two years has been safety engineer of the Edgar Thomson Steel Works of the Carnegie Steel Co., at Braddock, Pa., has been made head of the safety first department of the Carnegie Steel Co., Pittsburgh, in charge of safety work in all plants of the Carnegie Steel Co., in the Pittsburgh and valley districts. He succeeds E. M. Peak, who enlisted in the United States army several months ago and who now holds the rank of captain.

H. D. Savage, vice president of the American Arch Co., New York and Chicago, has been made vice president of the Locomotive Pulverized Fuel Co., 30 Church street, New York, of which he has been manager of sales since 1917. Mr. Savage was born in Memphis, Tenn., and started his business career with the Ashland Fire Brick Co., Ashland, Ky. He became sales manager and served for 10 years. He was instrumental in forming the Refractory Manufacturers' association and served as its first president.

Archibald J. Wolfe has been placed in charge of the far western division of the W. J. Crouch Co., Inc., 253 Broadway, New York, exporter. He has been in charge of various sections of the foreign department of the National association of Manufacturers and for three years traveled abroad as commercial agent of the United States department of commerce. At one time he represented the United States Steel Corp., in Petrograd, visiting the Balkan States and Asia Minor.

Peter Stewart, Boylston, Mass., was recently promoted to the position of general superintendent of the south works of the American Steel & Wire Co., Worcester, Mass., to succeed J. Lester Perry. He was formerly assistant superintendent which position now is filled by Charles P. Vaill, who has been superintendent of the cable works. George T. Jones takes the latter position. J. Lester Perry has been transferred to the north works to succeed Charles R. Putnam as superintendent who has joined the organization in the Cleveland district.

# Iron and Steel Men in War Machine

## Christian Girl, Mover of Millions—Men and Munitions—By Motor Truck

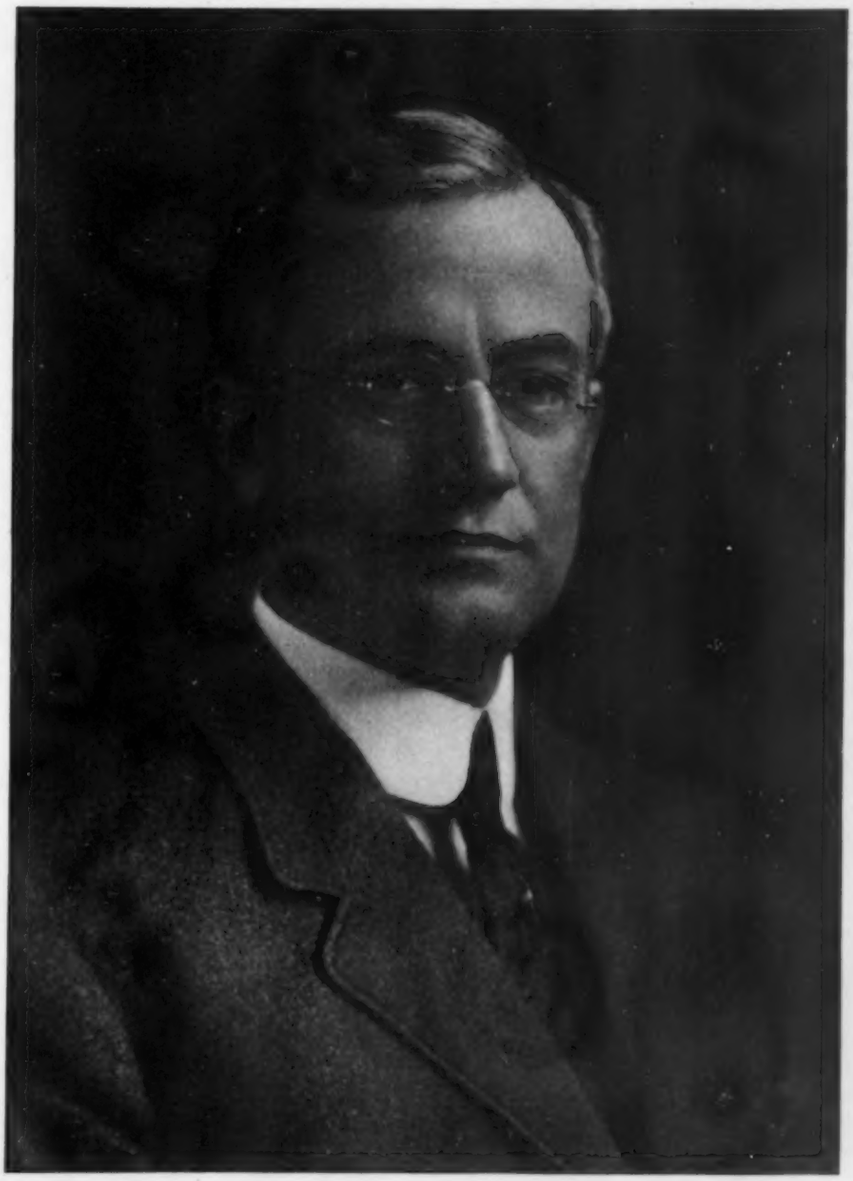
CHRISTIAN GIRL, ex-farmer, ex-preacher, ex-waterboy, ex-street sweeper, ex-laundry distributor, ex-coachman, ex-milk wagon driver, ex-postman and now automobile spring maker, steel parts manufacturer and chief supplier of motor trucks to the United States army, would seem almost to have run the whole gamut of occupations. All of which disproves his own statement that he dislikes work. In the ranks of those to whom the war has brought an enlarged scope of activity, in proportion to their ability, Mr. Girl stands high. Last August the war department realized that trucks would play an all-important part both at home and abroad in the successful prosecution of the war. Speed was a paramount necessity. Somebody must be secured who could bring the country's truck production facilities into line. Secretary Baker consulted with automobile makers. They unanimously voted for Mr. Girl. Why? Because they were familiar with his peculiar faculty for organizing others to do great things. They perhaps had heard him say "standardization means co-operation and co-operation means increased production." They could see that a standardized truck would mean the army's needs quickly filled. He was selected. In 48 hours, his personal affairs were in shape for his departure to Washington where within 10 days not only was his office established but a national organization perfected for the army's truck supply. That the confidence of the government and of the auto builders in Mr. Girl was not misplaced is demonstrated by the published statement that he now supplies the war machine with 12 motor trucks an hour.

The winding up of his personal affairs in 48 hours speaks well for the systematic side of Mr. Girl's character since he is president of the Standard Parts Co., Cleveland, capitalized in December, 1916, at $35,000,000. This company now operates 13 plants making automobile parts. This great business unit is the outgrowth of the Perfection Spring Co., Cleveland, formed in 1906 with Mr. Girl's $100 in cash and Michael McIntyre's ability to make automobile springs.

When a postman, Mr. Girl always on the lookout for an opportunity to break away, saw it in steel. Of this commodity he has said: "Steel is a basic product which people have to use at all times and in all seasons." He said to Mr. McIntyre: "Whatever we make must be perfect." So by expending 50 per cent of the cash on hand for fees, the Perfection Spring Co. was incorporated, with Mr. Girl as president and chief stock salesman. Without help from bankers, but founded upon an absolute belief of the president in himself and in his product, the company won out handsomely in the face of many obstacles.

Mr. Girl stated recently: "While the automobile is over draft age, liberty's greatest weapon against the kaiser's minions today is the motor truck." He is wielding that weapon vigorously by placing standardized trucks under Pershing in France sufficient to meet every call.

Mr. Girl was born on a farm in Elkhart, Ind., in 1874 and was educated in the Elkhart high schools.



CHRISTIAN GIRL

# Iron and Steel Financial News

**Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers**

# Begin Loan Drive With Cheerful Spirit

WITH American troops taking their place in the allied line to combat the final assault of the German armies on the western front, the third big war loan has been launched under auspices differing from previous loans. Enthusiasm is greater than ever and on every side are expressions of determination to eclipse previous efforts. A direct appeal is being made to the people all over the country by means of a gigantic advertising campaign which is unprecedented in its scope and organization. Wall street is extremely optimistic over the prospects for large oversubscription to this loan. It also is greatly relieved over the fact that the treasury had overestimated its needs, reducing the minimum on this loan by several billion dollars. Iron and steel and allied manufacturers responded heartily to previous calls by the government for money and indications are that the third loan will receive similar broad participation, despite reduced earnings of many corporations during the first quarter of this year. The feature of the new issue of 4¼ per cent bonds is the placing of the redemption date in 1928, or only 10 years away, as against a 25-year maturity for the outstanding 4s and a 30-year maturity for the outstanding 3½s.

*Wall Street Confident*

Wall street opinion, as reflected in the stock market, since the first onslaught has been that the efforts of the Germans would fail. After the beginning of the first attack on March 21 the stock market declined slightly but recovered almost immediately, since which time it has been dull but steady. Trading was less active last week than at any time since August, 1916. Stocks of iron and steel producers advanced fractionally. President Wilson on Saturday signed the bill creating a War Finance Corp., with a capital of $500,000,000 and with authority to issue $3,000,000,000 in bonds for the assistance of essential war industries. The railroads are expected to benefit greatly by this step and the placing of orders by them will likely follow.

## Carbon's Net Large

That the high peak of earnings for the Carbon Steel Co., Pittsburgh, was reached in the final quarter of 1917, and that earnings for the first quarter of 1918, because of fuel shortage, adverse weather conditions, freight embargoes, etc., will be much less was the purport of President Charles McKnight's recent statement to stockholders. Net profits for the quarter ended Dec. 31, less sundry adjustments were $871,604. While the total surplus at the end of the year was $3,851,167. After deducting $250,000 for dividends; $76,491 employes' bonus for fiscal year ended Sept. 30; $349,722 estimated income and express profits taxes, and $188,070 for depreciation, the net surplus on Jan. 1 was $2,918,633.

## Stock Again Raised

With the proposed increase of $600,000 in capitalization, made necessary by contemplated plant extensions, the Liberty Steel Co., Warren, O., will have outstanding $1,000,000 common stock, $500,000 preferred and $150,000 bonds. This will make the second increase in capital stock before the plant is completed. It is reported that work will go forward immediately on the four proposed additional tin mills, making 12 in all, with an annual capacity of about 900,000 base boxes.

## Earnings Exceed Record

An annual report of the condition of the By-Products Coke Corp., Syracuse, N. Y., shows that 1917 was the best year in its history. Total earnings for the year ended Dec. 31, were $3,415,259 compared with $2,473,345 for 1916. The company's best year prior to 1916 was 1913, when the earnings were $869,359 as against $780,724 in 1915. Net earnings in 1917 totaled $3,089,783, compared with $2,219,643 in 1916 and $607,985 in 1915. Assets and liabilities, according to the company's trial balance sheet as of Dec. 31, totaled $17,771,002, as compared with $11,986,646 at the end of 1916.

## Sloss Net Liberal

Earnings of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., during 13 months ended Dec. 31, 1917, totaled $2,152,373 as against $1,990,675 for the year ending Nov. 30, 1916, according to the financial statement just issued. The fiscal year has now been changed to correspond with the calendar year and the following comparative income account gives the figures for those periods:

| | 1917 | 1916 |
|---|---|---|
| Balance | $2,152,373 | $1,990,675 |
| Operating profit | $3,370,614 | $2,230,000 |
| Interest | 227,500 | 239,325 |
| Deprec. and depletion. | 665,741 | ..... |
| War taxes | 325,000 | ..... |
| Preferred dividend | 573,881 | 469,000 |
| Common dividend | 148,869 | ..... |
| Surplus | $1,429,623 | $1,521,675 |

The amount available for common after preferred dividends was equal to $15.78 a share as compared with $15.22 the previous period.

## Lull is Experienced

W. H. Westinghouse, chairman of the board of the Canadian Westinghouse Co., in presenting its financial statement said:

"The business aspect of the first half of the past year was a continued activity at high pressure in execution of previously placed orders for war supplies. In the latter portion of the year, with the realization that for reasons entirely apart from the record of successful performance made by the manufacturers of Canada, further allotments on a like scale would not be forthcoming in the immediate future, a general curtailment of operations took place which was the first lull in a continued strain of more than two years. These circumstances found your company with a some-

what greater than normal accumulation of orders booked for its standard lines of apparatus, and, with completion of its munitions work, successful attention was given to expanding output of this regular product."

Net operating income for 1917, after deductions for war taxes, patriotic contributions, etc., was $957,285. Other income brings the total to $1,011,276. In 1916 the operating income was $1,154,534 and in 1915 it was $860,628. After deducting $165,000 for depreciation, a balance of $846,276 was available for dividends.

## Huge Earnings Enjoyed

Among those who have made records for high earnings in 1917, the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., stands high. Net earnings increased from $359,374 in 1916 to $1,619,569, or over 300 per cent. After deductions for interest, contingencies, war taxes, etc., $540,154 was left for dividends. Preferred dividends of $131,341 were paid and the surplus of $408,813 was equal to $25.55 a share on the $1,600,000 common stock. At the end of 1916 the surplus was $79,205 and was equal to $4.99 a share. The comparative income account follows:

| | 1917 | 1916 |
|---|---|---|
| Net earnings | $1,619,569 | $359,374 |
| Interest | 211,053 | 147,500 |
| War taxes | 410,000 | ..... |
| Reserves | 458,362 | ..... |
| Balance | $540,154 | $211,874 |
| Preferred dividends | 131,341 | 132,669 |
| Surplus | $408,813 | $79,205 |

## Doubles Its Profits

With sales and profits more than double the 1916 figure, the United Alloy Steel Co., Canton, O., had the most successful year in its history during 1917. Gross sales approximated $33,700,000 as against $16,700,000 in 1916, compared with $9,800,000 in 1915. This increased production was made possible by the new plant B, which practically doubled the company's ingot capacity. Net profits for the year were $6,400,000, while in 1916 they totaled $3,000,000 and in 1915, $2,600,000. Federal taxes were estimated at $1,500,000, and this deducted with an allowance for depreciation, the net earnings amounted to $4,400,000 equivalent to $8.80 a share on the capital stock.

## Largely on Cash Basis

President Finley P. Mount of the Advance-Rumely Co., La Porte, Ind., and Battle Creek, Mich., in his annual report to stockholders says that 80 per cent of the company's business is now on a cash basis. "Your company's cash position," he states, "has been so strengthened that no borrowing was done in 1917 and none is contemplated in 1918."

Net earnings for 1917 were $550,557 or 4.40 per cent on the $12,500,000 preferred stock, as compared with $283,478 or 2.27 per cent earned in 1916. During the year $701,625 was set aside as a reserve against depreciation of assets. The comparative income account follows:

| | 1917 | 1916 |
|---|---|---|
| Gross profit | $2,101,832 | $1,757,344 |
| Other income | 317,394 | 420,976 |
| Total income | 2,419,226 | 2,178,320 |
| General expense | 1,703,468 | 1,689,941 |
| Net profits | 715,758 | 488,379 |
| Interest | 165,200 | 204,901 |
| Surplus | 550,557 | 283,478 |
| Previous surplus | 283,478 | ..... |
| Total surplus | 834,035 | 283,478 |

## Submarine Gains Reduced

While the net income of the Electric Boat Co. in 1917 was $2,080,038, equivalent to $27.11 per share, as compared with $6,479,449 in 1916, or $84.45 per share, dividends paid out in 1916 totaled $4,603,260 as against only $1,380,978 in 1917. Surplus for the year amounted to $699,060 as compared with $1,876,189 in 1916. During the year $1,168,094 was written off against the reduction in the market price of Russian rubles owing for submarines shipped to Russia. The net income of the Submarine Boat Corp. for the year was $1,248,099, and President Henry R. Carse explains that the margin of profit in the building of submarines has been narrowed by the increased costs for labor and materials. "Production has been interfered with," he states, "because of the need for training large forces of men in special lines of work". Unfinished business on the books of the Electric Boat Co. and the Electro Dynamic Co. Jan. 1, 1918, was in excess of $53,000,000.

## Tool Companies Merge

Representing a merger of the Aurora Automatic Machinery Co. and the Independent Pneumatic Tool Co., Chicago, a certificate has been filed at Dover, Del., by the former changing its name to the Independent Tool Co. The Independent company has previously been a subsidiary of the Aurora Automatic, which owned all the former's outstanding stock. The combined pamphlet report of the Aurora Automatic Machinery and Independent Pneumatic Tool Cos. for the year ended Dec. 31, 1917, shows net earnings of $819,636 from which a reserve of $179,731 was set aside for war taxes, interest, etc. The cash position of the company shows a remarkable gain over the previous year, the figures being $274,042 in 1917 as compared with $8373 in 1916.

# Release Toluol

**For Private Consumption But Price Not Fixed—Benzol Weaker**

New York, April 6.—The committee of the war industries board named to co-ordinate the government requirements of toluol so that sufficient quantities might be set aside for essential commercial requirements, has acted favorably upon a number of applications from consumers. The quantities granted so far are not large and only a few releases have been allowed. It is expected, however, that the action of the past week foreshadows a policy of providing for essential commercial requirements on a growing scale. It is unlikely that at any time in the near future, enough toluol will be released to take care of all requirements. It is felt by the committee that some uses not imperative to public welfare will have to be eliminated during the war. No price has been fixed on the toluol released for private consumption but it is expected that higher than $1.50 per gallon at producers' plants, the price that the government is paying, will be set. The market probably will range from $1.75 to $2 per gallon at producers' plants.

The market on benzol is weaker and prices cover a wide range. Pure benzol may be quoted at 30 to 40 cents per gallon. A number of large sales have been made during the week at 30 to 35 cents. Phenol, solvent naphtha and naphthalin reflect no change. Sales of phenol in only occasional spot lots are going at 52 to 55 cents per pound. Solvent naphtha continues strong at 18 to 22 cents per gallon. Naphthalin is quoted at 10 to 12 cents per pound, but this range is almost entirely nominal, since producers, by reason of their sold-up condition, are unable to accept any business.

## Coke Oven By-Products

**Spot**

Per Gallon at Producers Plant

| | |
|---|---|
| Pure benzol | $0.30 to .40 |
| Toluol | (nominal) |
| Solvent naphtha | .18 to .22 |

Per Pound at Producers Plant

| | |
|---|---|
| Phenol | $0.52 to .55 |
| Naphthalin (nominal) | .10 to .12 |

Per 100 Pounds at Seaboard

| | |
|---|---|
| Sulphate of ammonia (nominal) | $5.40 to 5.50 |

**Contract**

| | |
|---|---|
| Pure benzol | $0.30 to .40 |
| Pure benzol | $0.35 to .40 |
| Toluol | nominal |
| Solvent naphtha | .18 to .22 |

Per Pound at Producers Plant

Phenol nominal.

Per 100 Pounds at Seaboard

Sulphate of ammonia.....nominal

# Western Tool Inquiries Increase

### Steady Demand Indicates Fulfillment of Promised Westward Trend of Heavy Ordnance Construction—Eastern Requirements Are Light in All Lines—Limited Crane Business Develops from Isolated Sources

LIGHT buying and a comparative lull governs in the eastern machine tool market, while the districts west of Pittsburgh report a steady and increasing demand for practically all classes of shop equipment. This condition has been indicated by the trend of war orders and expected contracts during the past two weeks. Clearly defined lines of demarcation relative to the class of equipment needed cannot be closely drawn geographically as practically every class of machine shop is being steadily called into war service. However, during the past week Detroit has developed a large demand for heavy equipment suitable for the manufacture of carriages, mounts and tubes for large guns. The shell situation seems dormant, following the absorption of contracts covering the needs of the current period of the war. Increased activity on this class of munitions, however, may be expected soon. That the government is thoroughly awake to every ramification of the machine industry is evidenced by the supervision which this week diverted from export to France a list of machines which is capable of doing valuable service in this country. Dealers are appreciating the government attitude in the emergencies which arise, and are cooperating without question in allotting such tools as they can obtain, to manufacturers whose needs are for war essentials. The question of price has not up to the present entered into those individual cases where priority has governed. Deliveries show little change, but the lull in some quarters, it is hoped, will allow manufacturers a breathing spell in which to catch up, and incidentally to prepare for the demand which is impending. In remote instances, a tendency to secure stock tools against the coming increase in demand has been noted. Tool prices show an upward trend all along the line. Crane orders are slack.

# Additional Tool Demand Gathers Volume

WHILE the situation in the eastern machine tool market has been quiet for some time, sellers pronounce the volume of demand as now being the smallest in many weeks. No large lists are extant and there doesn't appear to be even the volume of small inquiries which has comprised the bulk of demand during the past month. This lull, while welcome in many respects to machine tool builders, is causing some apprehension owing to the speedy deliveries which no doubt will be demanded once the government gets its new program under way. There has been some quiet buying by the government in anticipation of this work, however, and in this connection an action of considerable significance recently was taken by a Pennsylvania builder in cancelling a large order for tools from a New York export house. These tools, which aggregated many thousands of dollars, were purchased for stock and were later to be sold, as demand arose, in France and other allied countries. That these tools would soon find their way into effective use, there was little question. Yet, inasmuch as the purpose and the urgency of the work for which they would serve was not apparent, influence caused the machine tool builder to cancel the contract.

*Machine Deliveries Improve*

Deliveries on machine tools generally are somewhat better, although large lathes, ranging from 32 inches up, and shapers are exceedingly scarce for early shipment. It is believed that the best that can be done in a majority of instances on these tools is six or seven months. Radial drills can be had in about two months, while shapers may be obtained in little less time. Milling machines, as a rule, are being quoted for delivery in about three months. Small lathes appear plentiful. Despite the somewhat easier position of machine tool builders, prices in several instances are tending upward. In addition to advances recently noted, an increase of 5 per cent went into effect April 5 on a line of shapers and a boost of 15 per cent in turret lathes is scheduled for April 15. It is thought that these advances soon will become more general. This upward trend in prices is said to reflect the steadily increasing costs of skilled labor.

Included in recent business is an order by the Virginia Shipbuilding Co. for a number of tools for its plate and angle shop at Alexandria, Va. The Sun Shipbuilding Co., 1428 South Penn Square, Philadelphia, recently bought a few radial drills. Several turret lathes were included in the recent purchase of the John Thompson Press Co., Long Island City, N. Y. The Pneumatic Tool Supply Co., Rahway, N. J., is buying equipment for a new machine shop. Some tools still are to be bought by the Singer Mfg. Co., which is erecting a $300,000 addition to its plant at Elizabethport, N. J.

Demand for cranes shows no improvement, as little is coming out in the way of new inquiry. Included in business now before sellers are 13 3-ton electric hoists for the Chester Shipbuilding Co., Chester, Pa., three travelers and one transfer bridge for the Braden Copper Co., New York; one 20-ton electric crane for the Thomas Iron Co., Philadelphia, and one 15-ton traveler for Westinghouse, Church, Kerr & Co., New York City, for installation in the government's new explosive plant at Sheffield, Ala.

*Intermittent Small Lots in Chicago Market*

LARGE lots of shop equipment seem to be a thing of the past in the Chicago market for the present and attention now is being given to fill-in buying and single tools for concerns which have expanded their needs.

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**AGATHON Vanadium**
**AGATHON Chrome Vanadium**
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**AGATHON Chrome Nickel**
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## The Central Steel Company

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**Cleveland Office:** Hickox Building. The Hamill-Hickox Company, District Representatives
**Chicago Office:** 1370 People's Gas Bldg., 122 South Michigan Blvd. C. H. Beach, District Representative
**Philadelphia Office:** 603 Widener Bldg. Frank Wallace, District Sales Manager
**Syracuse Office:** 621 University Blk. T. B. Davies, District Sales Manager
J. E. Dockendorff & Co., 20 Broad St., New York, General Export Agents

*Say you saw it in* THE IRON TRADE REVIEW

Even the arsenal at Rock Island is buying only the odds and ends not at first needed, to round out shop equipment. The Standard Steel Car Co., Hammond, Ind., is still taking some machinery, supplementing former heavy buying. This expansion is believed to be about complete. The Davenport Mfg. Co., Davenport, Iowa, has taken a subcontract for war work and is in the market for general machine shop equipment. Deere & Co. have bought the plant and business of the Waterloo Gas Engine Co., Waterloo, Iowa, and will make it their tractor department. Considerable equipment is being bought by tractor manufacturers, as this industry is expanding rapidly under stress of war demand. Numerous price advances are being made taking the general market level gradually upward. The Western Foundry & Machine Co., Moline, Ill., will build a foundry. The Andrews Engineering Co., Chicago, is building a large shop equipped with 10-ton crane to manufacture steel mill machinery. Chicago is planning to spend nearly $5,000,000 for new bridges of the bascule type. The Tri-City Steel Co., Madison, Ill., manufacturer of railroad equipment will build a rolling mill at that place. The Allis-Chalmers Mfg. Co., West Allis, Wis., will build an additional foundry. The Hebb Motor Co., Lincoln, Nebr., plans to build a plant at Havelock, Nebr. The Schultheis Co., San Diego, Cal., is building a plant at Los Angeles, including foundry and machine shop.

*Brisk Demand Noted in Cleveland District*

DEALERS in northern Ohio and Michigan report a steady and increasing demand for machine tools, particularly the heavier equipment. The inquiries do not comprise large lists in most cases, but consist of imperative requests for individual tools for plant extensions and to supplement existing equipment. The requirements from Detroit have been particularly large. The class of machinery needed in most cases being that employed in machining heavy gun carriages and gun mounts, and gun tubes, as very little additional shell business is in sight. Three firms, the Kelsey Wheel Co., the Maxwell Motor Co., and the Timken Detroit Axle Co., all of Detroit, have furnished a large bulk of business of this class. Dealers are practically unable in most cases to furnish some classes of machine tools or to promise delivery unless the machines desired are for specific government work. Increased activity is also apparent in the vicinity of Dayton. The class of tools desired is for the most part light, although some heavy machines are asked. The Ohmer Fare Register Co., Dayton, O., is inquiring for 5 and 6-foot radial drills, horizontal boring mills, a large vertical milling machine, three 6-foot vertical boring mills, one 10-foot vertical boring mill and other miscellaneous tools. The Monarch Engineering Co., Dayton, O., is in the market for a precision bench lathe and a surface planer.

*Shipments Improve in Pittsburgh Region*

SHIPMENTS are improving in the Pittsburgh district, according to makers and sellers of machinery and machine tools. Only moderate activity characterizes the market for rolling mill equipment. Both government and private lists coming to the Pittsburgh district are lacking in heavy requirements. The Riverside Engineering Co., Huntington, W. Va., has been incorporated with a capitalization of $5000. The Kelly Bros. Mfg. Co., Belington, W. Va., has been incorporated with a capitalization of $50,000, to operate a foundry. The Armstrong Cork & Insulation Co., with main offices in Pittsburgh, has closed for a number of Sidney lathes and turret lathes for the production of 4.7-inch shells at its Lancaster, Pa., plant.

## Many Changes and New Ventures Are Announced

*The Reliance Coal & Coke Co., Cincinnati, has taken over the Pittsburgh office of its subsidiary, the Reliance Iron & Coke Co., 1226 Park building, Pittsburgh, of which Ray S. Fox is manager.*

*The general offices of the Maxwell Motor Co., Detroit, have been moved from Woodward and Warren avenues to the Chalmers plant.*

*The Grants Pass Iron & Steel Works has been reorganized and incorporated under the name of the Klamath Iron & Steel Works to operate a general foundry and machine shop at Klamath Falls, Oreg.*

*The McDowell Mfg. Co., manufacturer of metal stampings, has closed its office at 541 Wood street, Pittsburgh, and removed to the works at Millvale Station, Allegheny county, Pennsylvania.*

*The general sales office of the Interstate Iron & Steel Co. has been removed from the First National Bank building to the Monroe building, 104 S. Michigan avenue, Chicago, where also will be located the sales department formerly maintained by the company at the Grand Crossing plant.*

*Mayer & Clarkson Co., Inc., 453 Ellicott square, Buffalo, has been incorporated and will maintain warehouse and sales facilities in Buffalo, Cleveland and Canton, O., for the handling of iron, steel, brass, copper and mill supplies.*

*The offices of the Cromwell Steel Co. have been removed from the Guardian building to 1125 Leader-News building, Cleveland.*

*The general sales office of the Vulcan Soot Cleaner Sales Co., 230 South La Salle street, Chicago, has been transferred to Du Bois, Pa., with G. L. Simonds in charge.*

*The Abell-Howe Co. has removed its Chicago offices to 332 South Michigan avenue, and has been appointed direct representative for the Standard Malleable Iron Co., Muskegon, Mich., for the sale of malleable castings through its offices at Chicago, Pittsburgh, Cleveland and New York. The Abell-Howe Co. also has been appointed direct representative of the Northern Engineering Works, Detroit, builder of electric traveling cranes, electric hoists and foundry equipment, in territory tributary to Chicago.*

*The Aborn Steel Co., Inc., 22 Clarke street, New York City; and 133 Andrews street, Rochester, N. Y., has been appointed sales agent for the Century Steel Co. of America, Inc., manufacturer of crucible steels, Poughkeepsie, N. Y.*

*The New York district sales offices of the Trumbull Steel Co. have been removed to a new suite in the Grand Central Terminal, New York.*

*The Biggs-Watterson Co., Cleveland, has removed its Cincinnati office to 38 S. Jefferson street, Dayton, O. W. P. Dolle will have charge of the new office.*

*The Wolverine Metal Sales Co., Detroit, seller of ferromanganese, ferrosilicon and other alloys, has recently moved into its new quarters in the Griswold building, that city.*

# *EXPANSION with ROLLING MILL JIM*

Say fellows—was out to the Hubbard the other day and the boys showed me the plans of the new steel foundry they're putting up. She sure is a humdinger—electric furnaces and all that. The next time I go over I'll rubber around a lot more and tell you all about it.

So long,

*Rolling Mill Jim.*

**Hubbard Steel Foundry Co.**

EAST CHICAGO, IND.

*All Kinds of Iron and Steel Rolls and Steel Castings.*

*Say you saw it in* THE IRON TRADE REVIEW

# New Construction and Equipment

**Concise and Timely Business Building Opportunities from the Field of Industry**

## Among New England Factories

AUGUSTA, ME.—The United States Chemical Copper Co. has been incorporated with $5,750,000 capital by Clyde R. Chapman, E. L. McLean and E. M. Leavitt.

EASTPORT, ME.—The Eastern Steamship Co. suffered $50,000 damage from a fire suspected to be of incendiary origin.

BANGOR, ME.—The Bangor Shipbuilding Co. has been incorporated with $200,000 capital by Charles Murray, Victor Hodgkins, John H. Rice, Everett W. Beach, Lee, Me., Edward E. Harvey and Eben Leavitt. It will use the old Crosby yard for building ships.

MILFORD, N. H.—The Milford Co. has been incorporated with $5,000,000 capital to provide hydro-electric power in southern New Hampshire.

SWANTON, VT.—The plant of the International Explosives Co., engaged in making primers and detonators for the government, was destroyed by an explosion, March 28.

BOSTON. — Burnham's Marine Railway, which has been under lease to the Atlantic Works for several years has been bought by that corporation and will be extensively repaired.

BOSTON.—Papers were recorded at the local registry on Wednesday, transferring to the United States government the Lockwood Manufacturing Co. wharf at 63-65 Sumner street, East Boston. The purchase price was $115,000. The property, which has a frontage on Sumner street of 185 feet, contains 120,000 square feet of land. There are several buildings on the premises, a marine railway and necessary hoisting apparatus for hauling out vessels for repairs. The government proposes to make extensive changes and addition and to use the place for repairing and equipping all kinds of power craft.

BROCKTON, MASS.—Bids are being received by Architect W. F. Barlow on a $30,000 plant addition. The owner's name is being withheld.

FITCHBURG, MASS.—The Simonds Mfg. Co., saws and machine knives, is having plans made for a brick, mill construction, 3-story and basement, 140 x 50-foot addition to its factory on Willow street.

HOLYOKE, MASS.—The American Braiding Co. has leased a floor of the new building of the Holyoke Valve & Hydrant Co. and has ordered an equipment of 175 modern braiding machines.

MILTON, MASS.—The Walter Baker Co., Ltd., will build a brick and stone, fireproof, 3-story, 75 x 67-foot administration building on Washington street, Milton Lower Mills, Mass.

NORTHBORO, MASS.—A $10,000 factory addition will be erected by Whittaker & Bacon. The new structure will be 40 x 150 feet.

PITTSFIELD, MASS.—The General Electric Co. has bought 37 lots on the East branch of the Housatonic river, adjoining the company's land. General Manager C. C. Chesney has announced plans for a rolling mill to be built here.

QUINCY, MASS. — The American Shipbuilding Corp. is reported to have taken an option on land on the Quincy side of the Neponset river, where it is understood a plant will be erected for the construction of wooden vessels.

SPRINGFIELD, MASS. — The Republican Co. has let the contract for a steel, 20 x 120-foot storage building on Cypress street.

WATERTOWN, MASS.—The Stanley Motor Carriage Co. will erect a new factory on Galen street.

WORCESTER, MASS.—A property damage estimated at $10,000 was sustained Thursday, when an explosion wrecked the factory portion of the Shepard Mfg. Co. plant at Greendale. The explosion blew out practically every window in the 1-story plant, wrecking the rear portion, about 50 by 75 feet, and blowing heavy doors as far as 25 feet from the building. The concern is engaged in the manufacture of a very important product for the government.

PROVIDENCE, R. I.—George E. Boyden & Son will build a brick, mill construction, 2-story, 44 x 160-foot addition to their mill on Borden street, to cost $20,000.

PROVIDENCE, R. I.—The Lord Construction Co., 105 West Fortieth street, New York City, has secured a contract for equipping 20 seagoing vessels with steam plants and engines. As a partial result, a new plant will be established at Field's Point, Narragansett bay, near here.

WARREN, R. I.—The Lynn Rubber Mfg. Co., of Lynn, Mass., has started to build a new rubber factory here.

HUNTINGTON, CONN. — The Shelton Tool & Machine Co. has been incorporated to manufacture tools, gages and machinery, with $20,000 capital by Frank E. Birschfield, Frederick G. Bouteiller, Derby, Conn., and Harold E. Drew, Ansonia, Conn.

MANCHESTER, CONN. — The F. W. Cheney Co. has been incorporated here with a capital of $50,000 to handle machinery. The incorporators are Horace B. Cheney, Austin Cheney and Frank D. Cheney, all members of the silk manufacturing concern of Cheney Brothers.

NAUGATUCK, CONN.—A four-story factory building 100 x 250 feet of concrete is being erected here for the United States Rubber Co. When completed, it will be one of the largest manufacturing plants here.

NEW HAVEN, CONN.—The Al-Ko Co. has been incorporated to make machinery with $25,000 capital by Arthur B. Alling, Frederick H. Wiggin and I. Dwight Dana.

NORWICH, CONN.—The Versailles Sanitary Fibre Co. has awarded to the Connecticut Engineering Co. the contract for the erection of a 2-story addition. The company has made a number of improvements in its plant during the past winter.

NORWALK, CONN. — The MacMahon, Cremins & Worthington, Inc., manufacturers of lace curtains in New York City, have leased the vacant building of Vanderhoef & Co. on Orchard street and will renovate and equip it for manufacturing purposes.

STAMFORD, CONN.—The United Dress Manufacturing Co. is planning for the addition of two stories to its plant here.

STAMFORD, CONN.—A. B. Bensch & Co., controlling the Davenport Foundry here, will begin work at once upon a large 1-story brick factory building, increasing the size of the plant about one-half, for the manufacture of automobile trucks and motors. About 200 hands will be employed in the addition and new machinery will be installed.

STAMFORD, CONN.—The Brown Foundry has commenced work on a new building, 90 x 130 feet, to be equipped with molding and other machinery. This concern is now working indirectly for the government on brass castings and marine engines.

VERSAILLES, CONN. — The Versailles Sanitary Fibre Co. has let the contract for a 2-story addition.

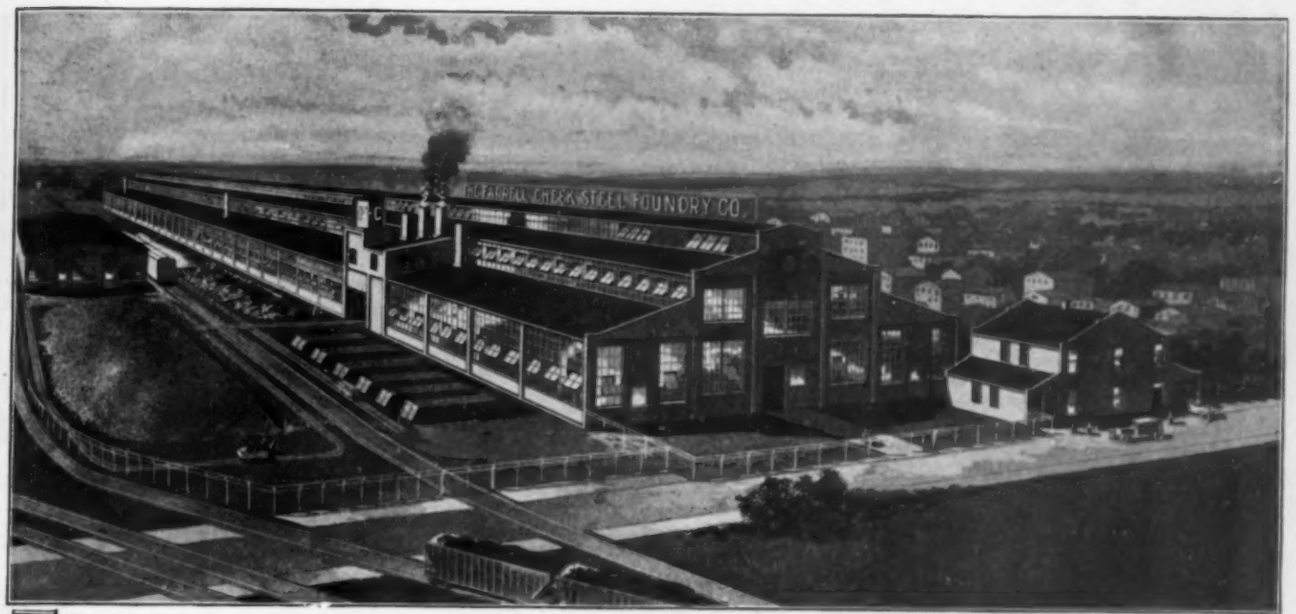
WATERBURY, CONN. — The American Brass Co. has let the contract for a brick, steel and concrete, fireproof, 1-story, 50 x 105-foot mill building.

## Along the Middle Atlantic Seaboard

ALBION, N. Y.—Plans are being drawn for the construction of a plant comprising two buildings, each one-story high, 75 x 100 feet. George Whelan, of this city, as a representative of a company now being organized, is in charge of the project.

AUBURN, N. Y.—A 2-story, 60 x 100-foot factory building will be erected in this city by the Auburn Button Co.

BINGHAMTON, N. Y.—Charles E. Magill, 34 Commercial avenue, is interested in a new company which is having plans prepared for

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We specialize ***Tractor, Truck*** and ***Machine Tool*** Castings. Particular attention paid to the strain and stress under which castings are to be subjected.

If you wish castings with the greatest resilient strength and minimum weight, specify ***Farrell-Cheek Castings.***

We are also manufacturers of Blank Gears; Carbonizing Boxes and Case Hardening Boxes.

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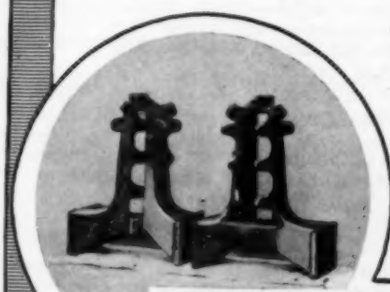

**Farrell-Cheek Steel Foundry Co.**

SANDUSKY, OHIO

*Branch Offices:*

PHILADELPHIA
NEW YORK
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a plant on Emma street, to manufacture heavy machinery and tools.

BROOKLYN, N. Y.—A $35,000 factory will be erected by Frank Richards, 160 Jamaca avenue. William C. Winters, 106 Van Sicklen avenue, is drawing plans for a 4-Motor Co. will build an addition to its automobile plant, which will be four stories, 78 x 228 feet. Fred T. Ley & Co., 19-25 West Forty-fourth street, New York City, will be in charge of the construction.

BUFFALO. — B. H. Westcott, Ellicott square, has plans for a 4-story factory 50 x 100 feet at this place.

BUFFALO.—Estimates are being taken on a factory building for the South Buffalo Terminal, Inc., which will cost around $30,000. The building will be one story, 60 x 90 feet.

BUFFALO. — A $20,000 factory will be erected in this city by the Standard Mirror Co. According to plans now being drawn by Architect G. Morton Wolfe, the proposed structure will be one story, 82 x 119 feet.

JAMESTOWN, N. Y. — The Jamestown Wood Finishing Co. is having plans prepared by Chapman Graham, Inc., for a 2-story facdition to the plant of R. M. Hollingshead & Company.

NEWBURGH, N. Y.—Plans are about completed for the construction of a 1-story, 100 x 200-foot storage building for the Central Hudson Steamboat Co. Tooker & Marsh, 101 Park avenue, New York City, are architects in charge.

NIAGARA FALLS, N. Y.—A $3,000,000 power station is being contemplated by the New York state reservation committee, Albany, for construction on Goat Island.

OSWEGO, N. Y.—The general contract for a $35,000 foundry extension for the Ames Iron Works has been let to the J. D. Taylor posed addition will be one story high, 52 x Construction Co., Syracuse, N. Y. The pro-200 feet.

ROME, N. Y.—The Rome Brass & Copper Co. has awarded to W. D. Jones the general contract for a $25,000 storehouse.

WATERTOWN, N. Y. — D. G. Corbett plans the construction of a 1-story, 50 x 50-foot machine shop.

ALLENTOWN, PA. — The International Motor Co. is planning to build a 1-story machine shop, 100 x 480 feet; cost, $75,000.

BETHLEHEM, PA. — The Aldrich Pump Co. will take bids shortly on the construction of a 1-story, 41 x 150-foot addition to its plant.

CHAMBERSBURG, PA. — The Chambersburg Woolen Mill Co. will build an extension to its plant here to cost $20,000. The contract has been let to E. M. Shields of that place.

CORRY, PA.—The Howard Tanning Co. is having plans prepared for a $50,000 addition to its plant here.

DUNMORE, PA. — The Duckworth Bros. Co., 1 Exchange building, Scranton, Pa., has plans for a 2-story factory 30 x 186 feet for the Perpetual Spark Plug Co., about $30,000.

FARRELL, PA.—The American Sheet & Valley railroad. The extension will cover 148 x 88 feet and will cost $35,000.

FRANKLIN, PA.—The Chicago Pneumatic Tool Co. is planning to improve its plant to the extent of $200,000; W. O. Duntley, president.

GROVE CITY, PA.—Rose and Fisher, 1719 Pennsylvania avenue, Pittsburgh, have a contract for a 3-story power plant for the Grove City Creamery Co.

HAZLETON, PA.—The Austin Co., this city, has a contract for a $100,000 powder mill at Havre de Grace, Md.

HAZLETON, PA. — The Lehigh Valley railroad is planning to build a plant for repairs to engines and cars.

HILLSBURG, PA. — The Dillsburg Mfg. Co., capitalized at $20,000, will purchase some equipment for its men's hosiery plant here.

KENNETT SQUARE, PA.—The Fiber Spe-Westinghouse building, have plans for a $20,-000 candy factory on North High street, Columbus, O., for the Busy Bee Kitchen Kandy Co. of that city.

LANSDALE, PA.—The Lansdale Foundry Co. has let contract for an addition 40 x 60 and 40 x 50 feet. H. I. Landis is president of the company.

MARCUS HOOK, PA.—The Benzol Products Co. is having plans drawn for an aniline building, laboratory and office by F. W. Van Loon, North Eleventh street, Philadelphia.

MILTON, PA.—The Milton Car & Foundry Co. has let a contract for a 1-story rivet shop.

## Government Inquiries

*Bids on the following equipment are desired by the navy department, bureau of supplies and accounts, Washington;*

Electric traveling crane for gunshop, 2908, April 15, Puget Sound, Wash.

High speed steel cutters, 3835½, April 22, Washington.

One switching locomotive, 3963½, April 19, f. o. b. works.

One locomotive, 3971½, April 15, Mare Island.

Four steel flat cars, 3972½, April 19, Indian Head.

Eight workshop trucks, 3980½, April 19, Philadelphia.

*The schedule numbers, dates of opening bids and places of delivery follow the specifications of the tools.*

*The General Engineer Depot,* 1438 *U street, Washington, under proposal* 767 *will receive bids until April* 12 *on* 10 *solid frame vertical punches, 24-inch throat, and* 80 *punches and dies for the same.*

PHILADELPHIA. — The Warren-Moore Co. has received the general contract for the construction of a 3-story addition to the machine shop of Hugo Bilgram.

PHILADELPHIA.—The Henry A. Hitner's Sons Co. has purchased 38 acres at Richmond and Buckius streets, as a site for a steel plant.

PHILADELPHIA.—The bureau of yards and docks is preparing plans for a submarine base at the Philadelphia navy yard. The bureau also is planning a number of store houses at Lake Denmark, N. J.

PHILADELPHIA.—Bids have been asked by the navy department on electrical equipment for a power house at the Philadelphia navy yard.

PHILADELPHIA. — The Union Transfer Co. will soon take bids on a $20,000, 2-story storage building.

PITTSBURGH. — Bartberger and Fisher, cialty Co. of this city has let a contract for a plant, 150 x 60 feet to William N. Worrell.

PITTSBURGH. — The Pittsburgh Rolls Corp. has secured a permit for the erection of a 1-story brick and steel foundry building in Willow street, between Forty-first street and Almond way, to cost $6000.

PITTSBURGH.—The Pennsylvania Chocolate Co., 5850 Center avenue, is arranging to build a $350,000 addition to its plant.

PITTSBURGH. — Charles D. Hall Co., Jenkins Arcade building, has plans for a power house for the Fox Coal Co. at this place. Address H. H. Wolf, First National Bank building.

SCRANTON, PA. — A $30,000 warehouse and service station will be erected from plans by the W. G. Wilkins Co., architect of Pittsburgh. The owner's name is being withheld.

SHARON, PA. — The Sitterding-Carneal-Davis Co. will build a 3-story warehouse; about $10,000.

WHEATLAND, PA. — The Pennsylvania railroad, it is reported, will build a round house, coal tipple, repair shop and turn tables here to cost $1,200,000.

BAYONNE, N. J.—American Reclaiming & Refining Co. has been chartered with $250,-000 capital to reclaim and refine metals. The incorporators are Bernard Rubin, Charles Dembe and H. B. Dembe, all of Bayonne.

BLOOMFIELD, N. J.—A. J. Krohn & Sons, Inc., has been incorporated with $10,-000 capital to manufacture metal beds. A. J. Krohn, Bloomfield, and Herman Krohn, of Newark, incorporators.

BUTLER, N. J.—Morris County Chemical Co. has been chartered with $100,000 capital to manufacture, chemicals, dyes, etc. The incorporators are Thomas S. Sexsmith, New York; William Joyce, Scranton, Pa., and Walter A. Clark, Butler.

CAMDEN, N. J.—Bids soon will be received by Irwin & Leighton, architects, 126 North Twelfth street, Philadelphia, for a $25,000 warehouse. The structure will be three stories high, 60 x 80 feet. The owner's name is being withheld.

CAMDEN, N. J.—Work will go ahead shortly on the construction of a $10,000 ad-story, 52 x 100-foot structure.

KEARNY MEADOWS, N. J.—It is understood that bids will be received soon by Architects Harris & Richards, Drexel building, Philadelphia, on a $2,000,000 plant for the Niles-Bement-Pond Co., 111 Broadway, New York City.

NEWARK, N. J.—Pipe & Bending Corp., of America has been chartered with $400,000 capital to manufacture pipes, tubes, etc. The incorporators are William Schmidt, Newark; H. H. Kistner, Elizabeth, and W. S. Weiss, New York.

NEWARK, N. J.—Perfection Tool & Machine Co. has been incorporated with $50,000 capital to manufacture engines, tools, etc. The incorporators are Emil Hurliman, Nathaniel Turock and Max Raschinsky.

NEW BRUNSWICK, N. J. — The Web Wire Works has completed plans for a 2-story, 35 x 45-foot addition to its plant.

PLAINFIELD, N. J.—The International Power Corp. contemplates the construction of a power plant in the village of Freeville, near here.

TRENTON, N. J.—Architect J. O. Hunter took bids April 1 on the construction of a $40,000 boat building plant for the Trenton School of Industrial Arts.

EDGEMOOR, DEL.—The general contract for a $75,000 shop addition at the plant of the Edgemoor Iron Co. has been let to E. E. Hollenback, 1804 Branywine street, Philadelphia.

SALTVILLE, VA.—The Fraser Brace Co., 1328 Broadway, New York City, has been awarded the general contract for the construction of a $1,500,000 plant at this place for the ordnance department.

# Are You Contemplating Building Operations?

A new factory—an extension—an entire new plant? If so, you can practically solve the building operation difficulties of the present times by placing your engineering and construction problems in the hands of The Arnold Company.

This highly specialized organization is thoroughly experienced in handling industrial problems. By centralizing in one competent source, the entire responsibility for the designing and construction of your plant—from preliminary study to completion, buildings and equipment, turned over to you ready for operation—you will save money and much time and needless worry over details.

Employing the Arnold Company to conduct your building operations, insures you of your plant being correctly designed for operating efficiency and of construction costs being kept to a minimum and of your plant being completed in the shortest possible time. You are invited to compare the Arnold Service with any similar organization—both as to costs and results—by referring to our many satisfied clients, some of whom we have served for more than twenty years.

***Explain your problem to us and let us submit our proposition. No obligation.***

**THE ARNOLD COMPANY**

**ENGINEERS—CONSTRUCTORS—ELECTRICAL, CIVIL, MECHANICAL**

**105 South La Salle Street, Chicago, Ill.**

The building illustrated above is a good example of what Arnold Methods have accomplished in the reduction of building costs, yet maintaining the high standard of design and construction the Arnold Company have adhered to for the past twenty years.

Practically sixty days from the first broken ground, this new factory for the Walker Manufacturing Company of Racine, Wisconsin was completed.

All equipment was installed and the plant was in operation within ninety days from the date of starting the work. We made the complete plans for building and equipment and turned the plant over ready for service.

The plans were made to cope with the present building conditions. For instance, a special type of steel structure was designed which required minimum shop work in making, greatly reducing the cost and avoiding delay. The steel for the structure was delivered in two weeks.

For this building, we originated a new method of providing a fireproof roof, using Structolite in ten foot spans, the first building of its kind in the United States.

The special type of roof construction, together with other new ideas, made possible a modern structure entirely of non-inflammable materials, at a saving of thirty per cent over the cost of similar buildings and at a great saving in the time required for completing the job.

In a multitude of ways the Arnold Company plans for saving time and money for its clients. No detail is too small to be given careful attention by the Arnold engineers.

By arranging for delivery of materials and equipment so they arrive on the site at the time they are needed, costly rehandling is avoided. By grouping and arranging proper sequence of operations, duplication and conflict of effort are minimized, and mistakes avoided.

Skilled, experienced men of the Arnold organization are placed in charge to direct the work from the time the ground is broken until the job is completed, and every phase of the work is carefully inspected, during construction and after completion insuring that every detail of Arnold construction comes up to the Arnold Standard.

# Activities in the Central States

CUDAHY, WIS.—The Ladish Drop Forge Co. will build a forge shop 50 x 250 feet, of reinforced concrete and steel at its Packard avenue plant.

GREEN BAY, WIS.—The board of education is considering the proposition of erecting an additional high school and manual training institute, the estimated cost of which is given as $350,000. An architect has not yet been selected.

MADISON, WIS.—Sealed bids are being received until April 15, at 2:30 p. m. for the construction of Bradley Memorial hospital and infirmary at the University of Wisconsin. Plans call for two buildings, 51 x 140 feet, two stories and basement, and the estimated cost is $100,000. Lew F. Porter is university architect.

MADISON, WIS.—The Municipal Appliance Co. of Madison has been organized by Hal R. Martin and A. T. Earle, Edgerton, Wis., to manufacture and market a line of automatic traffic signaling devices designed and patented by A. L. Masterson. The capital stock is $50,000.

MADISON, WIS.—The Madison Hardware Specialty Co. has been organized by a number of retail hardware dealers to engage in the wholesale hardware trade. The capital stock is $10,000 and the incorporators are Louis Hirsig, V. S. Kubly and T. E. Wiedenbeck. A large warehouse located on the Illinois Central tracks in West Madison has been leased and offices will be opened on the second floor of the Wolff, Kubly & Hirsig hardware store on South Pinckney street. The retail and wholesale business will be kept entirely independent.

MANITOWOC, WIS.—Bids will be taken soon for the construction of a new signal and light tower on the north breakwater of Manitowoc harbor. The estimated cost is $21,000. The building will be steel-sheathed with plates. Maj. Lewis H. Stoddard is district engineer, at Milwaukee.

MILWAUKEE.—The Babcock Auto Spring Co., 192 Milwaukee street, is building a 2-story factory and garage 60 x 120 feet to cost $20,000.

MILWAUKEE. — Architects Robert A. Messmer & Bro., Majestic building, have been engaged by the county board of administration to prepare plans for a $100,000 children's hospital to be erected at the county group in the city of Wauwatosa, Milwaukee county.

MILWAUKEE.—The Harley-Davidson Motor Co. has been granted a permit to erect a two-story reinforced concrete and brick shop addition, 120 x 180 feet, at its main plant at Fortieth and Chestnut streets. The building will cost $50,000 and is being erected under the direction of the Federal Engineering Co., Stephenson building, Milwaukee.

MILWAUKEE.—Alfred C. Clas, architect, Colby-Abbot building, is preparing plans for a viaduct to connect Mason street with the new Lake Shore drive, over the Chicago & Northwestern tracks. The structure will be of reinforced concrete and steel and about 500 feet long. F. P. Schumacher is secretary of the park board.

OSHKOSH, WIS.—The Universal Foundry Co., Warren and Pine streets, has increased its capital from $10,000 to $25,000 and will build an addition. R. Zibell is president.

RACINE, WIS.—The Wohlrab Gear Co., operating in leased quarters in part of the former Wisconsin Engine Co. plant at Corliss, Racine county, has taken a long term lease of the big factory building recently vacated by the Secor Trunk Co. at Lake avenue and Fourth street, in Racine, and will largely increase its output of motor truck, tractor and automobile gears. Considerable new equipment will be installed, together with new dynamos and other electrical apparatus.

REEDSBURG, WIS.—The city light and water commission has recommended the immediate installation of an additional 250-300 kilowatt generating unit, direct-connected to either a steam turbine or uniflow engine. An engineer will be selected at once to prepare specifications and estimates.

SUPERIOR, WIS. — The Lake Superior Electrical Co. has increased its capitalization from $50,000 to $250,000 and has changed its name to the Benson Electric Co. M. B. Benson is president and J. H. Cooke treasurer.

SUPERIOR, WIS. — Whitney Bros. have started work on the erection of a new punch shed for handling steel plates at its new shipbuilding plant at First street and Cummings avenue. It will cost about $10,000.

WAUSAU, WIS. — The National Auto Wheels Corp., organized at Wausau, Wis., about six months ago, has completed arrangements for erecting a factory in that city and expects to be engaged in a regular production of patented wheels for motor vehicles and trailers. The company is capitalized at $150,000 and its officers are: President, E. J. Coerper, Moon, Wis.; vice president, Henry Sternitzky, Crandon, Wis.; secretary, M. Philipp, Wausau; treasurer, R. R. Sternitzky, Rothschild, Wis.; director, G. E. Clase, Wausau. The factory will cost about $25,000 and designed so that additional units may quickly be provided.

WEST BEND, WIS. — The West Bend Aluminum Co., maker of drawn aluminum ware, utensils, etc., has decided to start work at once on the erection of several large factory additions which were projected during the summer of 1917 but indefinitely postponed because of conditions in the building material and labor markets. The main addition will be a three-story shop, 70 x 200 feet, and a one-story extension, 59 x 60 feet, will be made to the present shop. The buildings will be of reinforced concrete and brick. The work is in charge of the Federal Engineering Co., Stephenson building, Milwaukee.

DETROIT.—The Detroit Copper & Brass Rolling Mills, 1350 West Jefferson street, will build a plant.

NORTH MARQUETTE, MICH.—The Arnold Co. also has been awarded the contract for constructing all buildings included in plans for the new headquarters and terminal which the Munising, Marquette & South Eastern railroad will build near the Presque Isle dock at North Marquette this year. The work includes a locomotive and car building and repair shop, roundhouses, machine shops, etc., and all will be of steel, concrete and steel sash.

PORT HURON, MICH.—The city of Port Huron plans a bond issue to buy machinery for its waterworks pumping station. E. A. Whitmore is city engineer.

YALE, MICH.—The Yale Trailer Co., capitalized at $10,000, has been organized to manufacture automobile trailers. The incorporators are Rene V. Card, of Detroit, president and Earl R. Card, of Yale, secretary-treasurer.

CHICAGO.—The Pittsburgh Building Co., care Mundie & Jensen, 39 South La Salle street, architects, will build a 1-story machine shop, 125 x 185 feet at Kedzie and Forty-seventh streets.

CHICAGO.—A. J. O'Leary & Son, iron works, Lake and Jefferson streets will build a 1-story addition 60 x 70 feet, plans having been made by L. H. Heinz, architect, 128 North La Salle street.

DECATUR, ILL.—The Miller-Holbrook Engineering Co. has been incorporated with capital of $6000. Robert A. Miller, Frank D. Holbrook and Charles Connaghan are the incorporators.

MOLINE, ILL.—The Western Foundry & Machine Co., capitalized at $30,000, has been chartered by J. H. Johnson, A. C. Sinclair and R. S. Sinclair, to operate a foundry.

SPRINGFIELD, ILL. — Tentative plans have been drawn for the proposed Centennial building to be erected this year. The plans will soon be reviewed by the Centennial building commission.

SPRINGFIELD, ILL.—St. John's Hospital will erect an $80,000 St. John's tuberculosis sanitarium. Address, Father Joseph C. Stuart, Springfield, Ill.

SPRINGFIELD, ILL. — The Springfield Plow Co. will erect a brick, four-story warehouse, to cost $35,000.

EAST CHICAGO, IND.—The Green Engineering Co., Kennedy avenue and Fourteenth street, is building a foundry 45 x 100 feet costing $15,000. F. A. Keaser is superintendent.

INDIANAPOLIS. — The Steel Vehicle Wheel Tire Co., capitalized at $20,000, has been chartered to manufacture special machinery. Incorporators are C. R. Wofford, T. S. McGehee and C. A. Wofford.

MICHIGAN CITY, IND.—The Joseph W. Hays Corp., capitalized at $275,000, has been chartered to manufacture draft gages, gas recorders, and recording thermometers by Frank R. Warren, B. A. Tuttle and F. A. Deahl, the latter of South Bend.

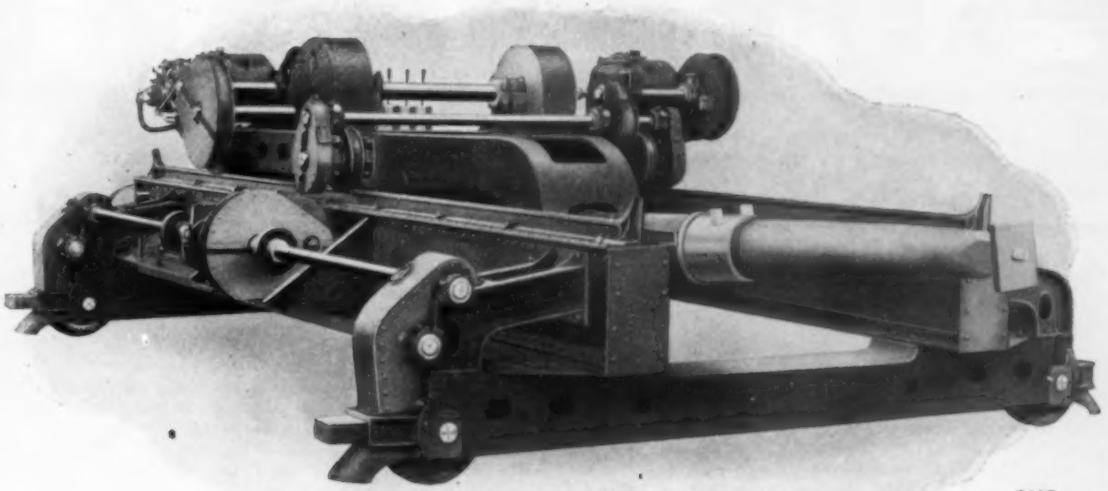
MONTPELIER, IND.—The National Cup Co., capitalized at $10,000 has been chartered to manufacture valve cups by C. H. Morse, B. H. Stoltz and D. J. Stoltz.

SOUTH BEND, IND.—The Anderson Co., recently chartered with $20,000 capital, will build a plant to manufacture automobile parts. J. W. Anderson is manager.

CLARKSBURG, W. VA.—The Fisher Summit Coal Co., capitalized at $50,000 was chartered to operate mines in Lewis county, by Walter S. Stewart, Florence B. Stewart, C. L. Currey, Harry W. Sheets and B. B. Jarvis, Clarksburg.

DUNBAR, W. VA.—The Whittemore Glass Co., capitalized at $150,000, will build a glass plant here.

HUNTINGTON, W. VA. — The Jeffery-




Low Type Charger Designed and Built for Republic Iron and Steel Co., Youngstown, Ohio

# CHARGING MACHINES AND MANIPULATORS

## A New W-S-M Bulletin

Of interest to users of charging and manipulating equipment is our new Bulletin A-7. It describes our various standard type Open Hearth chargers, also special machines for charging Heating Furnaces, for handling slabs, ingots, blooms, billets, wheels, tires, etc. We are prepared to build a special machine for your particular requirements.

## Write for Bulletin A-7

## The Wellman-Seaver-Morgan Co.

Cleveland, Ohio, U. S. A.

*Say you saw it in* THE IRON TRADE REVIEW

Dewitt Co. is having plans prepared for a $60,000 factory.

HUNTINGTON, W. VA.—The Huntington Lumber & Supply Co. has let a contract for a factory.

HUNTINGTON, W. VA. — The Handley Coal Co., capitalized at $25,000 to operate mines in Wayne county was chartered by W. Handley, E. N. Pyle, M. A. Simms, G. A. Koontz and E. E. Williams, Huntington.

MARTINSBURG, W. VA. — The Dunn Woolen Co. will build a 3-story addition costing $40,000.

NEWELL, W. VA.—The Kenilworth Tile Co. will rebuild its plant at a cost of $40,000. The plant will be 140 x 300 feet.

PARKERSBURG, W. VA.—Kahn & Feldman, of this city, have had plans prepared for a silk plant in this city. Address President C. M. Martin, of the Commerce building of Parkersburg.

WARWOOD, W. VA.—The Liberty Transit Co. is planning to build a river terminal at this place.

# Up and Down the Pacific Coast

CHEWELAH, WASH.—The further sum of $150,000 will be appropriated for equipping the plant of the Northwest Magnesite Co. R. N. Bishop is manager.

EVERETT, WASH.—The estimated cost of the machinery for the new steel plant of the United States Steel Co. to be erected here is $70,000 divided into the following expenditures: Rolling mill machinery $9000; reheating furnace, $4000; electric furnace $20,000; motor and machinery $7000; cranes and equipment $15,000; sundries and incidentals, $10,000.

NORTHPORT, WASH.—The Electric Point Mining Co. has completed plans to install an aerial tramway to cost $40,000 to $50,000.

SEATTLE.—Authorization has been given for the Milwaukee to extend its Olympic Peninsula line, operating westward from Port Angeles as far as Deep Creek into the large spruce timber belt in East Clallam and Jefferson counties.

SEATTLE.—Gerrick & Gerrick Co., Central building have the contract for erecting three steel bridges for the Spokane, Portland & Seattle Railroad Co. at about $30,000.

SPOKANE.—Colonel Chester T. Kennan, mining engineer of the Coeur d'Alene district, is working in the interest of a co-operative smelter which it is proposed to erect on Coeur d'Alene lake in Idaho.

SPOKANE.—The Pine Creek branch of the O. W. R. & N. Co., it is reported, will be constructed to Beeler, Idaho, at least and further if steel is available.

SPOKANE.—Issuance of $40,000 in bonds was recently authorized by Loon Lake Copper Co., same to be used in constructing a mill and equipping a mine four miles from Loon Lake, Washington. Equipment is to be driven by electric motors. Frank G. Crane is the secretary-treasurer of the company.

TACOMA, WASH.—In order to accommodate increased business the Atlas foundry has started construction of a new building to its plant at South Thirtieth and Alaska streets, to cost $1000, to be of frame.

ASTORIA, OREG.—The Interests of the Oregon Pacific Mill & Lumber Co., which some time ago arranged with the government for construction of a railroad from junction with the Spokane, Portland & Seattle line at Clatsop, have been taken over by a syndicate that will proceed at once with construction of first section of 17 miles, toward the Nehalem valley.

BURNS, OREG.—This place has voted an additional bond issue of $75,000 for securing railroad transportation.

FREEWATER, OREG. — Preston-Shaffer Milling Co. of Seattle, will build a concrete grain elevator of 85,000 bushels capacity at this place, which will be equipped with the latest appliances for handling and cleaning bulk and sacked grain. Fred A. Wilson Engineering Co., 322 Central building, Seattle, will design and supervise the complete installation, including the entire mechanical layout.

GRANTS PASS, OREG. — Contract has been awarded for installation of a large ore reduction plant for the Almeda Mines Co. on Rogue river, 27 miles below this place. There is to be a concentrating mill of not less than 200 tons daily capacity and blast furnaces of not less than 150 tons daily capacity, including power machinery for operation of entire plant. Contract price to be paid for the plant is $200,000.

PORTLAND, OREG.—Northwestern Electric Co. has a permit to erect foundation and walls for a boiler room at the foot of Lincoln street. Charles C. Moore & Co. are the engineers.

# New Business in Eastern Canada

NANAIMO, B. C.—The Granby Consolidated Smelting & Power Co. is proceeding with its preparations to install a coal plant. Ground is being cleared for the colliery, railroad yard and village. About $200,000 will be spent on the work.

NEW WESTMINISTER, B. C. — Mayor Gray confirms reports from Ottawa that application has been made to the Dominion government for a lease on the Indian reserve lying on an arm of the Fraser river for the construction of electric furnaces for the production of pig iron and steel billets.

BROCKVILLE, ONT. — T. J. Davidson, Crawford street, has the general contract for the erection of an addition to the plant of the Canada Carriage Co., Park street, estimated cost $40,000.

HANOVER, ONT.—The town council will install a waterworks plant and system to cost $40,000. John Taylor is clerk.

HICKSON, ONT. — The Canadian Milk Products, Ltd., 10 William street, Toronto, will build an addition to its plant at Hickson, and install machinery to cost $40,000.

LONDON, ONT.—The London & Petrolea Barrel Co., will build a dry kiln to cost $5000 and a boiler house to cost $3000.

OSHAWA, ONT.—Bradley Bros. are in the market for a 5-horsepower, 220 volt, single phase motor.

PORT ARTHUR, ONT. — Bids will be called about April 15, for the erection of an elevator for the Saskatchewan Co-operative Elevator Co., 332 Grain Exchange building, Winnipeg, Man., to cost $450,000.

STRATHROY, ONT. — The town council will purchase a motor driven turbine pump to be installed in the waterworks plant at a cost of $5000.

SAVANNE, ONT.—The Hyamdo Pulp & Paper Co., of Rochester and New York, has purchased Patrick Hogan's holding of nearly 300 square miles of timber limits and will build a pulp and paper mill at Savanne.

TORONTO, ONT. — The Canadian Allis-Chalmers Co., Ltd., Lansdowne and Royce avenues, will build a galvanized iron and steel addition to its smith shop to cost $6000.

WELLAND, ONT.—Plans are being prepared for remodeling the foundry of the Welland Iron & Brass Co., and new machinery will be installed. E. J. Anderson is manager.

MONTREAL, QUE.—The Canada Casting Co. has awarded contracts in connection with the erection of a plant which will cost $60,000.

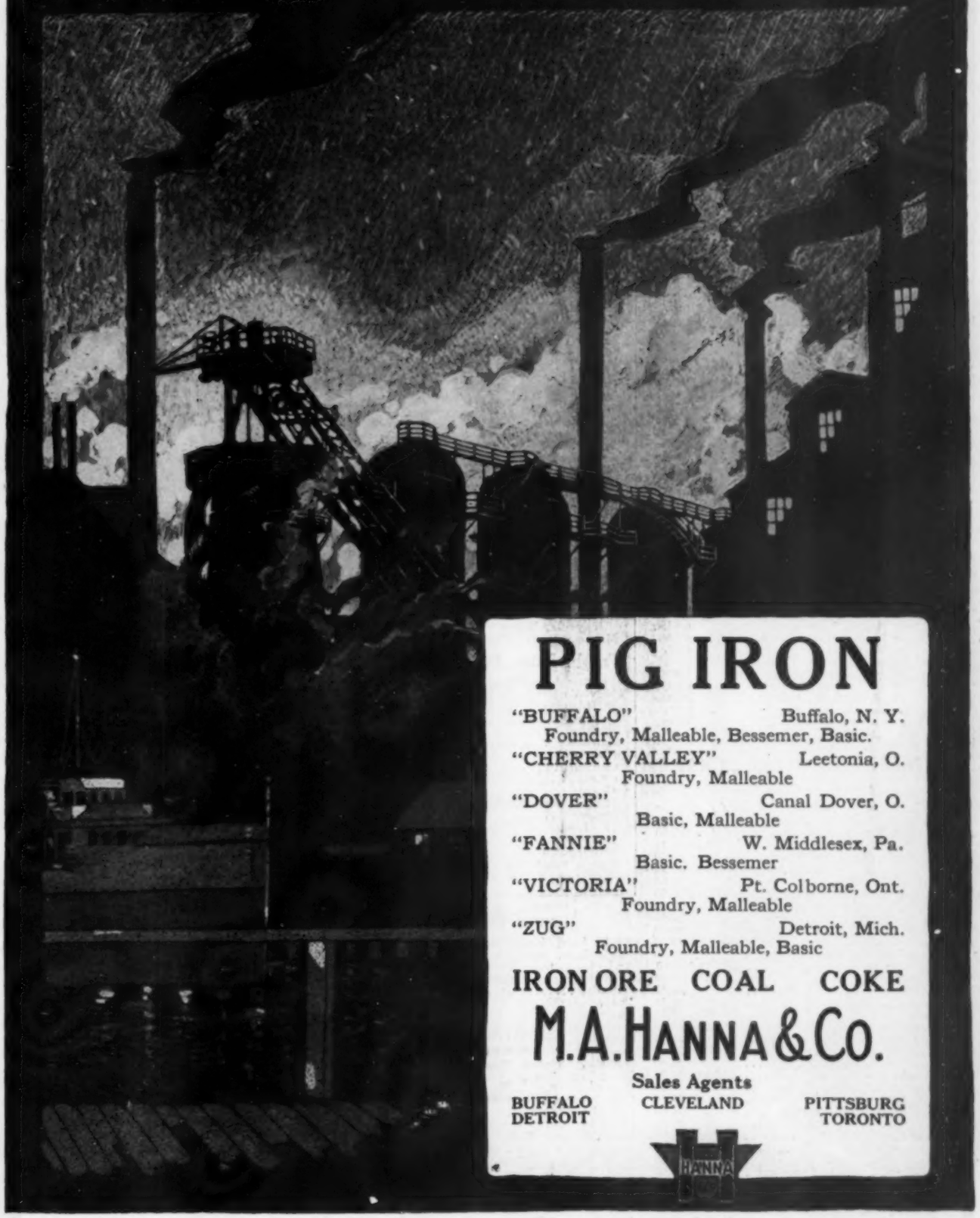
OUTREMOUNT, QUE.—Bids are in and contracts will be let at an early date for the erection of a plant for the Canada Metal Co., Ltd., 50 Brennan street. C. A. Mitchell, 14 St. John street, Montreal, is architect.

BRIDGEWATER, N. S. — The Davison Lumber Co., La Havre street, will build a sulphite plant, planing mill and box factory estimated to cost $100,000. A. F. Pamenter is acting manager.

YARMOUTH, N. S.—The Milton Shipbuilding Co. will establish a shipbuilding plant estimated to cost $100,000. Armand Deveaux is interested.

MONCTON, N. B.—Matthew Lodge, 274 Union street, is interested in a company which is being formed to develop the tungsten mine at Burnt Hill. A concentrating plant, etc., to cost $150,000 will be erected.

# HANNA



## PIG IRON

"BUFFALO" Buffalo, N. Y.
Foundry, Malleable, Bessemer, Basic.

"CHERRY VALLEY" Leetonia, O.
Foundry, Malleable

"DOVER" Canal Dover, O.
Basic, Malleable

"FANNIE" W. Middlesex, Pa.
Basic. Bessemer

"VICTORIA" Pt. Colborne, Ont.
Foundry, Malleable

"ZUG" Detroit, Mich.
Foundry, Malleable, Basic

**IRON ORE COAL COKE**

## M. A. HANNA & CO.

**Sales Agents**

BUFFALO CLEVELAND PITTSBURG
DETROIT TORONTO

HANNA

# Iron and Steel Prices

**Corrected to Tuesday Noon**

## IRON ORE

| Superior Ores, Per Ton, Lower Lake Ports | |
|---|---|
| Old range Bessemer, 55 iron | $5.95 |
| Mesabi Bessemer, 55 iron | 5.70 |
| Old range non-Bess., 51½ iron | 5.20 |
| Mesabi non-Bess., 51½ iron | 5.05 |

## WAREHOUSE PRICES

| | |
|---|---|
| Steel bars, Chicago | 4.10c |
| Steel bars, Cleveland | 4.035c |
| Steel bars, Detroit | 4.085c |
| Steel bars, Philadelphia | 4.10c |
| Steel bars, New York | 4.095c |
| Steel bars, St. Louis | 4.17c |
| Steel bars, Cincinnati | 4.085c |
| Steel bars, St. Paul | 4.22c |
| Steel bars, Buffalo | 4.05c |
| Iron bars, Buffalo | 4.65c |
| Iron bars, Chicago | 4.10c |
| Iron bars, Cleveland | 3.985c |
| Iron bars, Detroit | 4.75c |
| Iron bars, St. Louis | 4.17c |
| Iron bars, Cincinnati | 4.085c |
| Iron bars, Philadelphia | 4.50c |
| Iron bars, New York | 4.659c |
| Shapes, Chicago | 4.20c |
| Shapes, Detroit | 4.185c |
| Shapes, St. Louis | 4.27c |
| Shapes, St. Paul | 4.32c |
| Shapes, New York | 4.195c |
| Shapes, Cleveland | 4.135c |
| Shapes, Philadelphia | 4.20c |
| Shapes, Buffalo | 4.15c |
| Shapes, Cincinnati | 4.185c |
| Plates, Buffalo | 4.40c |
| Plates, Chicago | 4.45c |
| Plates, Detroit | 4.435c |
| Plates, St. Louis | 4.52c |
| Plates, St. Paul | 4.57c |
| Plates, New York | 4.445c |
| Plates, Cleveland | 4.385c |
| Plates, Philadelphia | 4.45c |
| Plates, Cincinnati | 4.435c |
| No. 10 blue anl. sheets, Chi. | 5.45c |
| No. 10 blue anl. sheets, Cleve. | 5.385c |
| No. 10 blue anl., Buffalo | 5.40c |
| No. 10 blue anl., sheets, St. L. | 5.52c |
| No. 10 blue anl. sheets, Cinci. | 5.435c |
| No. 10 blue anl. sheets, St. Paul | 5.57c |
| No. 10 blue anl. sh., Detroit | 5.435c |
| No. 28 black sheets, Chgo. | 6.45c |
| No. 28 black sheets, Cleve. | 6.385c |
| No. 28 black sheets, Cinci. | 5.45c |
| No. 28 black, Detroit | 6.435c |
| No. 28 black sheets, St. L. | 6.52c |
| No. 28 black sheets, St. Paul | 6.57c |
| No. 28 galv. sheets, Chgo. | 7.70c |
| No. 28 galv. sheets, Cleve. | 7.635c |
| No. 28 galv. sheets, Cinci. | 6.635c |
| No. 28 galvanized, Detroit | 7.685c |
| No. 28 galv. sheets, St. L. | 7.77c |
| Hoops, Cleveland | 4.885c |
| Hoops, Detroit | 4.935c |

## IRON AND STEEL SCRAP

(Prices in Gross Tons)

### STEEL WORKS USE

| | |
|---|---|
| Bundled sheets, Cincinnati | $22.50 to 23.00 |
| Bundled sheets, Pittsburgh | $22.00 |
| Bundled sheets, Cleveland | 23.50 to 24.25 |
| Bundled sheets, Buffalo | 24.00 to 25.00 |
| Boiler plate, cut, No. 1 Chgo. | 24.50 to 25.50 |
| Boiler plate, cut No. 1, St. L. | 25.50 to 26.00 |
| Frogs, switches, guards, St. L. | 28.50 to 29.00 |
| Frogs, switches, guards, Chgo. | 29.00 |
| Heavy melting steel, Pitts. | 29.00 |
| Heavy melting steel, Buffalo | 30.00 |
| Heavy melting steel, Chgo. | 29.00 |
| Heavy melt'g steel, Cleveland | 29.00 |
| Heavy melting steel, Cinci. | 26.50 to 27.00 |
| Heavy melt'g steel, east. Pa. | 27.50 to 28.50 |
| Heavy melting steel, N. Y. | 26.75 |
| Heavy melting steel, St. L. | 28.00 to 28.50 |
| Heavy melting steel, Birming. | 24.00 to 25.00 |
| Hydraulic press. sheets, Cleve. | 28.50 to 29.00 |
| Hydraulic press. sheets, Pitts. | 26.00 |
| Hydraulic press. sheets, Chgo. | 27.00 to 27.50 |
| Knuckles, couplers, Chgo. | 34.00 |
| Knuckles, coup. St. Louis | 33.75 to 34.00 |
| Low phos. steel, Buffalo | 37.50 |
| Low phos. steel, Pittsburgh | 39.00 |
| Low phos. steel, eastern Pa. | 36.50 |
| Shoveling steel, Chicago | 29.00 |
| Shoveling steel, St. Louis | 28.00 to 28.50 |
| Springs, Chgo. | 34.00 |
| Steel rails, short, Chicago | 34.00 |
| Steel rails, short, Cleveland | 34.00 |
| Steel rails, short, St. Louis | 33.75 to 34.00 |
| Steel rails, old, Birmingham | 28.00 to 30.00 |
| Stove plate, Chgo. | 25.50 to 26.50 |
| Stove plate, Cincinnati | 20.00 to 20.50 |
| Stove plate, St. Louis | 22.50 to 23.00 |
| Stove plate, N. J. points | 23.75 |
| Stove plate, Birmingham | 17.50 to 20.00 |
| Stove plate, Buffalo | 25.00 to 26.00 |
| Stove plate, eastern Pa. | 22.00 to 23.00 |
| Stove plate, Cleveland | 25.00 to 25.50 |
| Stove plate, Pittsburgh | 22.00 |
| Bundled sheets, Cincinnati | 20.00 to 20.50 |

## Freight Rates, Pig Iron

| | |
|---|---|
| Mahoning and Shenango valleys to: | |
| Cleveland | $0.95 |
| Newark, N. J. | 3.50 |
| Boston | 3.70 |
| Philadelphia | 3.30 |
| Pittsburgh | .95 |
| St. Louis | 3.18 |
| Minneapolis, St. Paul | 4.54 |
| Buffalo to: | |
| [illegible] N. Y. | $1.26 |
| New England (rail) | 3.10 |
| New York and Brooklyn (rail) | 3.10 |
| Virginia furnaces to: | |
| Philadelphia | $3.27 |
| New England | 3.77 |
| Brooklyn, Jersey City, Newark | 3.52 |
| Birmingham, Ala., to: | |
| Boston | 6.00 |
| Cincinnati | 2.90 |
| Chicago | 4.00 |
| Cleveland | 4.00 |
| Louisville, Ky. | 2.65 |
| Minneapolis, St. Paul | 5.85 |
| New York (r. and w.) | 6.00 |
| Philadelphia (r. and w.) | 5.25 |
| Pittsburgh | 4.90 |
| Savannah, Ga. | 2.75 |
| St. Louis | 3.40 |
| Chicago to: | |
| Des Moines | $2.80 |
| Milwaukee | .50 |
| Minneapolis, St. Paul | 2.00 |
| Moline, Ill. | 1.15 |
| Omaha | 3.58 |
| St. Louis | 1.58 |
| Ironton and Jackson, O., to: | |
| Chicago | $2.54 |
| Cincinnati | 1.26 |
| Cleveland | 1.62 |
| Detroit | 1.81 |
| Indianapolis | 1.58 |
| Minneapolis, St. Paul | 4.54 |
| Duluth, Minn., to: | |
| Minneapolis- St. Paul | $1.25 |
| Mayville, Wis.: | |
| Minneapolis-St. Paul | $1.75 |

## Freight Rates, Finished Material

| Pittsburgh, carloads, per 100 lbs., to: | |
|---|---|
| New York | 19.5 cents |
| Philadelphia | 18.5 cents |
| Boston | 21.5 cents |
| Buffalo | 16.0 cents |
| Baltimore | 18.0 cents |
| Cleveland | 13.5 cents |
| Cincinnati | 17.0 cents |
| Chicago | 21.5 cents |
| Detroit | 15.7 cents |
| Minneapolis and St. Paul | 32.9 cents |
| Denver | 82.5 cents |
| St. Louis | 27.0 cents |
| New Orleans | 30.0 cents |
| Birmingham | 45.0 cents |
| Pacific coast (all rail) | 75.0 cents |
| Pacific coast (tin plate) | 75.0 cents |

### IRON MILL USE

| | |
|---|---|
| Angle bars, iron, Chgo. | $39.00 |
| Angle bars, steel, St. Louis. | 35.00 to 35.50 |
| Arch bars, transoms, Chgo. | 46.50 |
| Arch bars and transoms, St. Louis | 45.00 to 45.50 |
| Busheling, No. 1, Cleveland. | 31.00 |
| Busheling, No. 1, Buffalo | 29.00 to 30.00 |
| Busheling, No. 2, Buffalo | 21.00 to 23.00 |
| Busheling, No. 1, Pittsburgh | 32.00 |
| Busheling, No. 1, Cincinnati. | 25.00 to 25.50 |
| Busheling, No. 1, Chgo. | 28.00 to 29.00 |
| Busheling, No. 2, Chgo. | 19.25 to 20.25 |
| Busheling, No. 1, St. Louis. | 27.00 to 27.50 |
| Cast borings, New York | 16.50 to 16.75 |
| Cast borings, eastern Pa. | 18.00 to 19.00 |
| Cast borings, Cleveland | 19.00 |
| Cast borings, Buffalo | 18.00 to 19.00 |
| Cast borings, Cincinnati | 15.50 to 16.00 |
| Cast borings, Pittsburgh | 19.00 |
| Cast borings, Birmingham | 12.00 to 13.00 |
| Cast borings, Chgo. | 18.00 to 18.50 |
| Cast borings, St. Louis | 17.00 to 18.00 |
| City wrought, long, N. Y. | 31.00 |
| Cut forge, Chicago | 32.00 to 33.00 |
| Forge flashings, small, Cleve. | 27.00 to 27.50 |
| Forge flashings, large, Cleve. | 27.00 to 27.50 |
| Forge No. 1, eastern Pa. | 25.50 to 26.50 |
| Grate bars, Buffalo | 24.00 |
| Grate bars, Cleveland | 25.50 to 26.00 |
| Grate bars, N. J. points | 23.75 |
| Iron axles, Pittsburgh | 46.50 |
| Iron axles, Cincinnati | 43.00 to 43.50 |
| Iron axles, Cleveland | 46.50 |
| Iron axles, eastern Pa. | 46.50 |
| Iron axles, Chicago | 46.50 |
| Iron axles, St. Louis | 46.00 to 46.50 |
| Iron axles, Buffalo | 45.00 to 47.00 |
| Iron rails, Chicago | 38.00 to 39.00 |
| Iron rails, Buffalo | 36.00 to 37.00 |
| Iron rails, Cincinnati | 32.00 to 32.50 |
| Iron rails, St. Louis | 34.00 to 35.00 |
| Iron rails, Cleveland | 34.00 |
| Machine turnings, Cincinnati. | 16.00 to 16.50 |
| Machine turnings, Cleve. | 19.00 |
| Machine turnings, Buffalo | 17.00 to 17.50 |
| Machine turnings, N. Y. | 15.50 |
| Machine turnings, Pitts. | 19.00 |
| Machine turnings, east. Pa. | 17.50 to 18.50 |
| Machine turnings, Birming. | 17.00 to 18.00 |
| Machine turnings, Chicago. | 18.00 to 18.50 |
| Machine shop turnings, St. L. | 18.50 to 19.00 |
| Pipes and flues, Cleveland | 24.50 to 25.50 |
| Pipes and flues, Chicago | 26.00 to 27.00 |
| Pipes and flues, St. Louis | 27.50 to 28.00 |
| R. R. mch. cast, No. 1, Buff. | 34.00 |
| R. R. wrgt. No. 1, Buffalo | 34.00 |
| R. R. wrgt., No. 1, east. Pa. | 34.00 |
| Railroad wrgt. No. 1 Cinci. | 33.50 to 34.00 |
| Railroad wrgt., No. 1, Cleve. | 34.00 |
| R. R. wrought, No. 1, Pitts. | 34.00 |
| Railroad wr'ght, No. 1, Chgo. | 33.50 to 34.00 |
| Railroad wr'ght, No. 2, Chgo. | 32.00 to 32.50 |
| R. R. wrgt. No. 1, Birming. | 26.00 to 27.00 |
| No. 1 yard wrought East Pa. | 33.00 |
| No. 1 busheling wrgt., E. Pa. | 32.00 |
| Sheet wrought, Pittsburgh | 34.00 |
| Railroad wrgt., No. 1, St. L. | 34.00 |
| Railroad wrgt. No. 2 | 33.50 to 34.00 |
| Wrought pipe, Buffalo | 27.00 to 28.00 |
| Wrought pipe, eastern Pa. | 31.00 to 32.00 |
| Wrought pipe, ungraded, eastern Pa. | 29.00 |

### IRON OR STEEL WORKS USE

| | |
|---|---|
| Axle turnings, Cleveland | $24.00 |
| Axle turnings, Buffalo | 24.00 |
| Heavy axle turn'gs, E. Pa. | 23.00 |
| Heavy axle turnings, Pitts. | 25.00 |
| Shafting, New York | 36.00 |
| Shafting, eastern Pa. | 39.00 |
| Steel car axles, Pittsburgh | 46.50 |
| Steel car axles, Birmingham. | 31.00 to 32.00 |
| Steel car axles, New York | 43.00 |
| Steel car axles, Buffalo | 44.00 to 46.00 |
| Steel car axles, Cleveland | 44.00 |
| Steel car axles, eastern Pa. | 46.50 |
| Steel car axles, Chgo. | 46.50 |
| Shafting, St. Louis | 37.50 to 38.00 |
| Steel car axles, St. Louis | 46.00 to 46.50 |

### IRON FOUNDRY USE

| | |
|---|---|
| Car wheels, (iron), Pitts. | $29.00 |
| Car wheels, (steel), Pitts. | 34.00 to 35.00 |
| Car wheels, eastern Pa. | 29.00 |
| Car wheels, Buffalo | 29.00 |
| Car wheels, Chicago | 29.00 |
| Car wheels, St. Louis | 28.50 to 29.00 |
| Car wheels, Birmingham | 25.00 to 28.00 |
| Car wheels, Cleveland | 30.00 |
| Tram car wheels, Birming. | 21.00 to 24.00 |
| Cast, No. 1 cupola east. Pa. | 32.00 |
| Cast, No. 1, Birmingham | 24.00 to 25.00 |
| Cast, No. 1, Cleveland | 31.00 to 31.50 |
| Cast No. 1, Cincinnati | 29.00 to 29.50 |
| Cast, 1, heavy, N. J. points | 32.25 to 32.75 |
| Cast, 1, machy., N. J. points | 32.25 to 32.75 |
| Cast No. 1, Chicago | 33.00 to 34.00 |
| Cast, No. 1, Pittsburgh | 34.00 |
| Cast No. 1 St. Louis | 27.50 to 28.00 |
| Malleable, Cincinnati | 30.00 to 34.00 |
| Malleable, Cleveland | 30.00 to 34.00 |
| Malleable, Buffalo | 29.00 to 34.00 |
| Malleable, Pittsburgh | 33.00 to 34.00 |
| Malleable, east. Pa. | 29.00 |
| Malleable, cupola, East Pa. | 32.00 |
| Malleable railroad, Chgo. | 32.00 to 33.00 |
| Malleable, agricultural, Chgo. | 33.00 to 34.00 |
| Malleable railroad, St. Louis | 28.00 to 28.50 |
| Malleabel agricultural, St. L. | 27.25 to 27.75 |
| Cast, No. 1, Cincinnati | 26.00 to 26.50 |

### MISCELLANEOUS USES

| | |
|---|---|
| Boiler punchings, Chgo. | 35.50 to 36.50 |
| Reroll. rails, 5 ft. & ov., Pitts. | 34.00 |
| Reroll. rails, 5 ft. & ov., Chgo. | 34.00 |
| Reroll. rails, 5 ft. & ov., E. Pa. | 34.00 |
| Reroll. rails, 5 ft. & ov., St. L. | 34.00 to 35.00 |
| Reroll. rails, 5 ft. or over, Cleve. | 34.00 |
| Rerolling rails, long, Birming. | 37.50 to 38.50 |
| Locomotive tires, Chgo. | 44.00 to 45.00 |
| Locomotive tires, St. Louis. | 37.50 to 38.00 |